

STIC

1-56

## INVENTOR SEARCH

=&gt; d his 147

(FILE 'HCAPLUS' ENTERED AT 11:04:52 ON 30 AUG 2007)  
L47 20 S L45 AND L46

=&gt; d que 147

L16 QUE ABB=ON PLU=ON PSEUDOMONAS?  
 L18 QUE ABB=ON PLU=ON COPOLYM? OR CO(W)POLYM?  
 L26 763 SEA FILE=HCAPLUS ABB=ON PLU=ON ("FUKUI, TATSUKI"/AU  
 OR "HONMA, TSUTOMU"/AU OR "IMAMURA, TAKESHI"/AU OR  
 "KENMOKU, TAKASHI"/AU OR "KOZAKI, SHINYA"/AU OR  
 "MIHARA, CHIEKO"/AU OR "YANO, TETSUYA"/AU)  
 L27 QUE ABB=ON PLU=ON SUGAWA E?/AU  
 L28 786 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 OR L26  
 L29 QUE ABB=ON PLU=ON FUKUI T?/AU  
 L30 QUE ABB=ON PLU=ON HOMA T?/AU  
 L31 QUE ABB=ON PLU=ON IMAMURA T?/AU  
 L32 QUE ABB=ON PLU=ON KENMOKU T?/AU  
 L33 QUE ABB=ON PLU=ON KOZAKI S?/AU  
 L34 QUE ABB=ON PLU=ON MIHARA C?/AU  
 L35 QUE ABB=ON PLU=ON YANO T?/AU  
 L38 QUE ABB=ON PLU=ON (CANON(W)KABUSHIKI?)/PA,CS,SO,CO  
 L41 9410 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 OR (L29 OR L30 OR  
 L31 OR L32 OR L33 OR L34 OR L35)  
 L42 122 SEA FILE=HCAPLUS ABB=ON PLU=ON L41 AND L38  
 L43 119 SEA FILE=HCAPLUS ABB=ON PLU=ON (L42 OR L28) AND L16  
 L45 21 SEA FILE=HCAPLUS ABB=ON PLU=ON L43 AND L18  
 L46 QUE ABB=ON PLU=ON PY<2003 OR PRY<2003 OR AY<2003 OR  
 MY<2003 OR REVIEW/DT  
 L47 20 SEA FILE=HCAPLUS ABB=ON PLU=ON L45 AND L46

=&gt; d his 161

(FILE 'MEDLINE, BIOSIS, DRUGU, EMBASE' ENTERED AT 11:14:08 ON 30  
AUG 2007)  
L61 7 S L60 AND L46

=&gt; d que 161

L16 QUE ABB=ON PLU=ON PSEUDOMONAS?  
 L17 QUE ABB=ON PLU=ON POLYHYDROXYALKANOATE OR POLY(W)HYD  
 ROXYALKANOATE OR POLY(W)HYDROXY(W)ALKANOATE  
 L26 763 SEA FILE=HCAPLUS ABB=ON PLU=ON ("FUKUI, TATSUKI"/AU  
 OR "HONMA, TSUTOMU"/AU OR "IMAMURA, TAKESHI"/AU OR  
 "KENMOKU, TAKASHI"/AU OR "KOZAKI, SHINYA"/AU OR  
 "MIHARA, CHIEKO"/AU OR "YANO, TETSUYA"/AU)  
 L27 QUE ABB=ON PLU=ON SUGAWA E?/AU  
 L28 786 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 OR L26  
 L29 QUE ABB=ON PLU=ON FUKUI T?/AU  
 L30 QUE ABB=ON PLU=ON HOMA T?/AU  
 L31 QUE ABB=ON PLU=ON IMAMURA T?/AU  
 L32 QUE ABB=ON PLU=ON KENMOKU T?/AU  
 L33 QUE ABB=ON PLU=ON KOZAKI S?/AU  
 L34 QUE ABB=ON PLU=ON MIHARA C?/AU  
 L35 QUE ABB=ON PLU=ON YANO T?/AU  
 L36 QUE ABB=ON PLU=ON L27 OR (L29 OR L30 OR L31 OR L32 O  
 R L33 OR L34 OR L35)  
 L38 QUE ABB=ON PLU=ON (CANON(W)KABUSHIKI?)/PA,CS,SO,CO  
 L46 QUE ABB=ON PLU=ON PY<2003 OR PRY<2003 OR AY<2003 OR  
 MY<2003 OR REVIEW/DT  
 L57 255 SEA L28  
 L58 10077 SEA L36 OR L57  
 L59 60 SEA L58 AND L38  
 L60 34 SEA L59 AND (L16 OR L17)  
 L61 7 SEA L60 AND L46

=&gt; dup rem 147 161

FILE 'HCAPLUS' ENTERED AT 11:22:00 ON 30 AUG 2007  
 USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.  
 PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
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FILE 'BIOSIS' ENTERED AT 11:22:00 ON 30 AUG 2007

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PROCESSING COMPLETED FOR L47

PROCESSING COMPLETED FOR L61

L63 27 DUP REM L47 L61 (0 DUPLICATES REMOVED)

ANSWERS '1-20' FROM FILE HCAPLUS

ANSWERS '21-27' FROM FILE BIOSIS

**INVENTOR SEARCH RESULTS**

=&gt; d l63 l-27 ibib ed ab

L63 ANSWER 1 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2004:430974 HCAPLUS Full-text

DOCUMENT NUMBER: 141:5889

TITLE: Production of novel polyhydroxyalkanoate  
copolymers by PseudomonasINVENTOR(S): Kennoku, Takashi; Yano,  
Tetsuya; Mihara, Chieko;  
Kozaki, Shinya; Honma, Tsutomu  
; Fukui, Tatsuki; Imamura,  
TakeshiPATENT ASSIGNEE(S): Canon Kabushiki Kaisha,  
Japan; Sugawa, Etsuko

SOURCE: PCT Int. Appl., 245 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004044213	A1	20040527	WO 2003-JP13531	2003 1023
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W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
JP 2004162044	A	20040610	JP 2003-356748	2003 1016
<--				
AU 2003274742	A1	20040603	AU 2003-274742	2003 1023
<--				
US 2006211100	A1	20060921	US 2005-531689	2005 0415
<--				
PRIORITY APPLN. INFO.:			JP 2002-310250	A 2002 1024
<--				
			JP 2003-356748	A 2003 1016
			WO 2003-JP13531	W 2003 1023

ED Entered STN: 27 May 2004

AB A process is provided for the production of novel polyhydroxyalkanoate copolymers by Pseudomonas bacteria grown on various precursor fatty acids. Also provided is a process for the chemical oxidation of these polyhydroxyalkanoates to obtain different unique polymers.

REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE

FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L63 ANSWER 2 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2004:370985 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 140:357893

TITLE: Biosynthesis of novel polyhydroxyalkanoate  
containing 3-hydroxy- $\omega$ -(4-  
carboxyphenyl)alkanoic acid units and  
composition thereof

INVENTOR(S): Fukui, Tatsuki; Yano,  
Tetsuya; Mihara, Chieko;  
Kozaki, Shinya; Honma, Tsutomu  
; Kenmoku, Takashi

PATENT ASSIGNEE(S): Canon Kabushiki Kaisha,  
Japan

SOURCE: PCT Int. Appl., 278 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2004037889	A1	20040506	WO 2003-JP13532	2003 1023
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W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA,  
CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES,  
FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG,  
KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK,  
MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU,  
SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,  
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM,  
AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ,  
DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL,  
PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN,  
GO, GW, ML, MR, NE, SN, TD, TG

JP 2004315782	A	20041111	JP 2003-356982	2003 1016
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AU 2003275603	A1	20040513	AU 2003-275603	2003 1023
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US 2006079662	A1	20060413	US 2005-531226	2005 0413
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PRIORITY APPLN. INFO.:			JP 2002-310310	A
			2002	
			1024	

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JP 2003-92408	A
2003	
0328	

JP 2003-356982	A
2003	
1016	

WO 2003-JP13532	W
2003	
1023	

ED Entered STN: 07 May 2004

AB A polyhydroxyalkanoate containing in a mol. thereof one or more 3-hydroxy-o-(4-carboxyphenyl)alkanoic acid units represented by chemical formula (I); wherein m is an integer selected from 0 to 7; R1 is an H, Na or K atom; and when more than one unit exists, n and R1 may differ from unit to unit, resp. Thus, 5-phenylvaleric acid and 5-(4-vinylphenyl)valeric acid were microbial copolymerized using *Pseudomonas cichorii* in polypeptone to give (R)-3-Hydroxy-5-phenylvaleric acid-(R)-3-hydroxy-5-(4-vinylphenyl)valeric acid isotactic copolymer which was oxidized by MnO<sub>2</sub> to give (R)-3-hydroxy-5-phenylvaleric acid-(R)-3-hydroxy-5-(4-carboxyphenyl)valeric acid isotactic copolymer. The polyhydroxyalkanoate has high thermal stability, charge stability, a high charge amount, improved dispersibility and biodegradability together, and therefore, suitable for resin moldings, and binders and charge controlling agents for toners used in the electrophotographic process.

L63 ANSWER 3 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2004:411682 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 140:414894

TITLE: Polyhydroxyalkanoates having cyclohexyl structures in side chains, their microbial manufacture, and their use for resin binders, electrophotographic toners, and electrophotographic image-forming process and apparatus

INVENTOR(S): Honma, Tsutomu; Furusaki, Shinya; Yano, Tetsuya

PATENT ASSIGNEE(S): Canon Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 63 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004143288	A	20040520	JP 2002-309635	20021024
JP 3647432	B2	20050511		
US 2004143087	A1	20040722	US 2003-692206	20031022
PRIORITY APPLN. INFO.:			JP 2002-309635	A
			20021024	

OTHER SOURCE(S): MARPAT 140:414894

ED Entered STN: 21 May 2004

AB Polyhydroxyalkanoates (PHA) having monomer units I (R1 = H, CN, NO<sub>2</sub>, halo, Me, Et, Pr, CF<sub>3</sub>, C<sub>2</sub>F<sub>5</sub>, C<sub>3</sub>F<sub>7</sub>), useful for electrophotographic toner binders, are manufactured by culturing microorganisms in media containing alkanolic acids II (R1 = same as above). Thus, *Pseudomonas cichorii* YN2 (FERM BP-7375) was shake-cultured in an M9 medium containing 0.5% yeast extract and 6.0 mM 3-cyclohexylpropionic acid at 30° to give 210 mg/L of PHA comprising 94% 3-hydroxy-3-cyclohexylpropionic acid unit and 6% medium-chain-length 3-hydroxyalkanoic acid units. A magenta toner containing the PHA, C.I. Pigment Red 114, NXVP 434 (charge controlling agent), and hexamethyldisilazane-treated hydrophobic silica powder showed good charging properties and biodegradability and gave high-quality images showing no fogging even under high temperature and humidity (30°, relative humidity 80%).

L63 ANSWER 4 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2004:57584 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 140:112164

TITLE: Thermally stable polyhydroxyalkanoate copolymers having ester group-containing units on the side chain and their manufacture

INVENTOR(S): Imamura, Takeshi; Kenmoku, Takashi; Fukui, Itsuki; Sugawa, Etsuko; Yano, Tetsuya

PATENT ASSIGNEE(S): Canon Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 48 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004018729	A	20040122	JP 2002-177285	2002 0618

JP 2004018729    A    20040122    JP 2002-177285  
2002  
0618

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JP 3880462    B2    20070214  
PRIORITY APPLN. INFO.:    JP 2002-177285  
2002  
0618

&lt;--

ED Entered STN: 23 Jan 2004

AB The copolymers have  $\text{OCH}[(\text{CH}_2)_n\text{CO}_2\text{R}]\text{CH}_2\text{CO}$  ( $\text{R} = \text{Me, Et, Me}_2\text{CH, Me}_3\text{C, PhCH}_2$ ;  $n = 1-6$ ) units and  $\text{OCH}[(\text{CH}_2)_m\text{R}']\text{CH}_2\text{CO}$  ( $m = 1-8$ ;  $\text{R}' = \text{Ph, thienyl, cyclohexyl}$ ) units and are manufactured from  $\text{ROCO}(\text{CH}_2)_p\text{CH}_2\text{CH}_2\text{CO}_2\text{H}$  ( $p = 1-6$ ) and  $\text{R}'(\text{CH}_2)_q\text{CH}_2\text{CH}_2\text{CO}_2\text{H}$  ( $q = 1-8$ ) by biosynthesis using microorganisms. Thus, *Pseudomonas cichorii* YN2 was incubated in M9 medium containing polypeptone, 5-phenylvaleric acid, and monomethyl sebacate at 30° for 40 h, centrifuged, washed with MeOH, freeze-dried, extracted with  $\text{CHCl}_3$ , filtered, evaporated, precipitated with cold MeOH, and dried to give a polymer having  $\text{OCH}[(\text{CH}_2)_4\text{CO}_2\text{Me}]\text{CH}_2\text{CO}$ ,  $\text{OCH}[(\text{CH}_2)_2\text{Ph}]\text{CH}_2\text{CO}$ , and  $\text{OCH}[(\text{CH}_2)_6\text{CO}_2\text{Me}]\text{CH}_2\text{CO}$  units with  $M_n 8.1 + 104$  and  $M_w 15.9 + 104$ .

L63 ANSWER 5 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2004:57581 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 140:129835

TITLE: Method for manufacture of pigmented coating compositions without the needs for dispersants

INVENTOR(S): Honma, Tsutomu; Nomoto, Takeshi;

Furusaki, Shinya; Yano, Tetsuya

PATENT ASSIGNEE(S): Canon Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 55 pp.

CODEN: JKXXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004018723	A	20040122	JP 2002-177236	2002 0618

JP 2004018723    A    20040122    JP 2002-177236  
2002  
0618

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PRIORITY APPLN. INFO.:    JP 2002-177236  
2002  
0618

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ED Entered STN: 23 Jan 2004

AB The method uses pigments which have surface at least partially coated or encapsulated by poly(hydroxyalkanoates) having specific pendants, graft or modification groups for improving pigment self dispersibility. The coating or encapsulation of pigments is done biol. using poly(hydroxyalkanoate) polymerase and hydroxyalkanoyl-coenzymes (as substrates).

L63 ANSWER 6 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2003:34935 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 138:98160

TITLE: Microbial poly(hydroxy alkanoate)-containing charge controlling agents for use in electrostatographic developer toners in image formation method and apparatus

INVENTOR(S): Yano, Tetsuya; Imamura,

Takeshi; Kenmoku, Takashi;

Sugawa, Etsuko

PATENT ASSIGNEE(S): Canon Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 43 pp.

CODEN: JKXXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2003012778 A 20030115 JP 2001-180627  
2001  
0614

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PRIORITY APPLN. INFO.: JP 2001-133552 A  
2001  
0427

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ED Entered STN: 15 Jan 2003

AB The agents have monomer units shown as  $AmB(1-m)$  [ $A = \text{CHRCH}_2\text{CO}_2$ ;  $B = \text{CH}((\text{CH}_2)_n\text{Me})\text{CH}_2\text{CO}_2$  and/or  $\text{CH}(\text{CH}_2\text{CH}:\text{CH}(\text{CH}_2)_k\text{Me})\text{CH}_2\text{CO}_2$ ;  $m = 0.01-1$ ;  $n = 0-10$ ;  $k = 3, 5$ ;  $R = (\text{CH}_2)_q\text{C}_6\text{H}_4\text{R}_1$ ,  $(\text{CH}_2)_r\text{OC}_6\text{H}_4\text{R}_2$ ,  $(\text{CH}_2)_s\text{C}_6\text{H}_{10}\text{R}_3$ ,  $(\text{CH}_2)_t\text{C}(\text{O})\text{C}_6\text{H}_4\text{R}_4$ ;  $\text{R}_1-\text{R}_4 = \text{H}$ , halo, CN,  $\text{NO}_2$ , CF<sub>3</sub>, C<sub>2</sub>F<sub>5</sub>, C<sub>3</sub>F<sub>7</sub>;  $r, q, s, t = 1-8$ ]. Electrostatog. developer toner binders containing the agents, electrostatog. developer toners containing binder resins, colorants, and the agents, image formation method and apparatus using the electrostatog. developer toners are also claimed. The agents are biodegradable and environmentally friendly and have improved dispersibility, changeability, stability, etc.

L63 ANSWER 7 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2003:29442 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 138:90972

TITLE: Biodegradable poly(hydroxyalkanoate) fishing lures and their manufacture

INVENTOR(S): Sugawa, Etsuko; Imamura, Takeshi; Kenmoku, Takashi; Honma, Tsutomu; Yano, Tetsuya

PATENT ASSIGNEE(S): Canon Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2003009721	A	20030114	JP 2001-201112 2001 0702	
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PRIORITY APPLN. INFO.: JP 2001-201112  
2001  
0702

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ED Entered STN: 14 Jan 2003

AB The lures are made of polymers having monomer unit compns.  $[\text{OCH}[(\text{CH}_2)_b\text{X}]\text{CH}_2\text{CO}]_m[\text{OCHYCH}_2\text{CO}]_{1-m}$  [ $\text{X} = (\text{un})\text{substituted Ph}$ , OPh, cyclohexyl, C<sub>6</sub>H<sub>5</sub>, 2-thienyl, 2-thienylcarbonyl;  $\text{Y} = (\text{CH}_2)_n\text{Me}$ ,  $\text{CH}_2\text{CH}:\text{CH}(\text{CH}_2)_k\text{Me}$ ;  $b = 1-8$ ;  $n = 0-10$ ;  $k = 3, 5$ ;  $m = 0.01-1$ ]. Thus, *Pseudomonas cichorii* YN2 FERM BP-7375 was cultured in a medium containing 5-phenylvaleric acid to give polymer comprising 96% 3-hydroxy-5-phenylbutyrate unit and 4% 3-hydroxybutyrate unit, which was molded to give a rod-like test piece showing good flexibility, recovery from bending, tensile strength, and biodegradability.

L63 ANSWER 8 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2003:693179 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 139:214919

TITLE: Polyhydroxyalkanoates containing a vinylphenyl structure in their side chain and method of manufacturing the same

INVENTOR(S): Honma, Tsutomu; Sugawa, Etsuko; Yano, Tetsuya; Imamura, Takeshi; Kenmoku, Takashi; Fukui, Tatsuki

PATENT ASSIGNEE(S): Canon Kabushiki Kaisha, Japan

SOURCE: Eur. Pat. Appl., 56 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 1340778 A1 20030903 EP 2003-4350  
2003  
0228

<--  
EP 1340778 B1 20060118  
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,  
MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ,  
EE, HU, SK

JP 2004238592 A 20040826 JP 2003-37322  
2003  
0214

<--  
JP 3689700 B2 20050831  
US 2003204044 A1 20031030 US 2003-372285  
2003  
0225

<--  
US 6645743 B2 20031111  
CN 1445257 A 20031001 CN 2003-106688  
2003  
0228

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PRIORITY APPLN. INFO.: JP 2002-54897 A  
2002  
0228

<--  
JP 2002-362962 A  
2002  
1213

<--  
JP 2003-37322 A  
2003  
0214

ED Entered STN: 05 Sep 2003

AB A polyhydroxyalkanoate (PHA) having a desired configuration is produced using a raw material containing  $\omega$ -(4-vinylphenyl)-alkanoic acid and  $\omega$ -substituted alkanoic acid in which a group having a ring structure selected from Ph, thienyl, and cyclohexyl structures substitutes therefor on the end thereof by producing a PHA copolymer containing the corresponding 3-hydroxy- $\omega$ -(4-vinylphenyl)-alkanoate unit and the corresponding 3-hydroxy- $\omega$ -substituted alkanoate unit by making use of a microorganism capable of producing the PHA or by oxidizing a predetd. portion of the corresponding PHA. *Pseudomonas cichorii* YN2 was cultivated with 5-(4-vinylphenyl)-valeric acid and 5-phenyl-valeric acid to give a polyhydroxyalkanoate.

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L63 ANSWER 9 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2003:653269 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 139:180526

TITLE: Polyhydroxyalkanoate copolymer  
including unit having bromo group in side  
chain and production method thereof

INVENTOR(S): Honma, Tsutomu; Kozaki,  
Shinya; Imamura, Takeshi;  
Kenmoku, Takashi; Fukui,  
Tatsuki; Sugawa, Etsuko;  
Yano, Tetsuya

PATENT ASSIGNEE(S): Canon Kabushiki Kaisha,  
Japan

SOURCE: Eur. Pat. Appl., 46 pp.  
CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 1336634	A2	20030820	EP 2003-3418	
			2003	
			0214	

EP 1336634	A3	20040107		
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EP 1336634 B1 20051123

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,  
MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ,  
EE, HU, SKJP 2004196832 A 20040715 JP 2002-362594  
2002  
1213

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JP 3754956 B2 20060315  
US 2003194789 A1 20031016 US 2003-359600  
2003  
0207

&lt;--

US 7135540 B2 20061114  
CN 1438258 A 20030827 CN 2003-104451  
2003  
0214

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PRIORITY APPLN. INFO.: JP 2002-39255 A  
2002  
0215

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JP 2002-310268 A  
2002  
1024

&lt;--

JP 2002-362594 A  
2002  
1213

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ED Entered STN: 22 Aug 2003

AB The title polyhydroxyalkanoate copolymer, prepared by microorganisms using a  $\omega$ -bromoalkanoic acid, is thermally stable and capable of arbitrarily controlling phys. properties. The polyhydroxyalkanoate copolymer includes a 3-hydroxy- $\omega$ -bromoalkanoic acid unit of  $\text{OCH}[(\text{CH}_2)_n\text{Br}]\text{CH}_2\text{CO}$  ( $n = 1-8$ ) and a unit of  $\text{OCH}[(\text{CH}_2)_m\text{R}]\text{CH}_2\text{CO}$  ( $m = 1-8$ ; R = Ph, thienyl, cyclohexyl) within a same mol.

L63 ANSWER 10 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:944749 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 138:14534

TITLE: Biodegradable cards comprising  
polyhydroxyalkanoates with good extrudability,  
heat resistance, and mechanical propertiesINVENTOR(S): Yano, Tetsuya; Imamura,  
Takeshi; Kenmoku, Takashi;  
Sugawa, Etsuko

PATENT ASSIGNEE(S): Canon Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 23 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002356542	A	20021213	JP 2001-164772	2001 0531

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PRIORITY APPLN. INFO.: JP 2001-164772  
2001  
0531

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ED Entered STN: 13 Dec 2002

AB The cards, useful for credit cards, IC cards, etc., contain polyhydroxyalkanoates having a repeating unit of  $\text{OCHXCH}_2\text{CO}$  [ $\text{X} = (\text{CH}_2)_a\text{R}_1$ ,  $(\text{CH}_2)_b\text{CH}_2\text{C}_6\text{H}_4\text{R}_2$ ,  $(\text{CH}_2)_c\text{OC}_6\text{H}_4\text{R}_3$ ,  $(\text{CH}_2)_d\text{CH}_2\text{C}_6\text{H}_{10}\text{R}_4$ ,  $(\text{CH}_2)_e\text{COC}_6\text{H}_4\text{R}_5$ ,  $(\text{CH}_2)_f\text{CH}_2\text{Y}$ ,  $(\text{CH}_2)_g\text{COY}$ ;  $\text{R}_1 = \text{H}$  ( $a = 5-10$ ), halo ( $a = 1-10$ ), chromophore ( $a = 1-10$ ), carboxy ( $a = 1-10$ ), oxiranyl ( $a = 1-7$ );  $\text{R}_2-4 = \text{H}$ , halo, CN,  $\text{NO}_2$ ,  $\text{CF}_3$ ,  $\text{C}_2\text{F}_5$ ,  $\text{C}_3\text{F}_7$ ;  $\text{R}_5 = \text{same as R}_2-4$ , Me, Et, Pr;  $\text{Y} = \text{thienyl}$ ; b, d, f = 0-7; c, e, g = 1-8]. The cards may have layers for printing, thermal recording, magnetic recording, and embossing. Thus, a multilayer card comprising D-glucose-4-fluorobenzenepentanoic acid copolymer [prepared in culture media containing *Pseudomonas cichorii* YN 2 (FERM BP-7375)] showed tensile strength 24.0 MPa and good embossability.

L63 ANSWER 11 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN



ACCESSION NUMBER: 2002:847920 HCAPLUS [Full-text](#)  
DOCUMENT NUMBER: 137:338648  
TITLE: Polyhydroxyalkanoate/thermoplastic resin blend  
compositions, their biodegradable  
heat-resistant moldings, and their  
thermoforming  
INVENTOR(S): Honma, Tsutomu; Imamura,  
Takeshi; Kenmoku, Takashi;  
Sugawa, Etsuko; Yano, Tetsuya  
PATENT ASSIGNEE(S): Canon Inc., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002322355	A	20021108	JP 2001-131691	2001 0427
<--				
PRIORITY APPLN. INFO.:			JP 2001-131691	2001 0427
<--				

ED Entered STN: 08 Nov 2002

AB The comps., useful for containers for foods, beverages, cosmetics, and pharmaceuticals, etc., contain (A) polyhydroxyalkanoates containing 1-99 mol% 3-hydroxy-5-benzoylvaleric acid (I)-derived monomer units OCH(CH<sub>2</sub>CH<sub>2</sub>COPh)CH<sub>2</sub>CO and (B) thermoplastic resins such as polyesters, polystyrenes, polypropylenes, poly(ethylene terephthalates), polyvinyls, and polyamides. Thus, a dry composition of 81:10:5:3:1 1-3-hydroxydecanoic acid-3-hydroxyoctanoic acid-3-hydroxyhexanoic acid-3-hydroxydodecanoic acid copolymer, prepared with *Pseudomonas cichorii* H45 from 5-benzoylvaleric acid was mixed with styrenic polymer (Styron 685) at ratio 50:50, sheeted by foam extrusion, and secondary molded into bowls for instant noodles having good biodegradability, high hardness and low brittleness at 25 and 100°, resp., Tg 40°, and Tm 156°.

L63 ANSWER 12 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:847533 HCAPLUS [Full-text](#)  
DOCUMENT NUMBER: 137:353523  
TITLE: Microbial production of polyhydroxyalkanoates  
for charge control agents for toners  
INVENTOR(S): Imamura, Takeshi; Sugawa,  
Etsuko; Yano, Tetsuya;  
Kenmoku, Takashi  
PATENT ASSIGNEE(S): Canon Kabushiki Kaisha,  
Japan  
SOURCE: Eur. Pat. Appl., 82 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1254918	A2	20021106	EP 2002-9696	2002 0429
<--				
EP 1254918	A3	20030226		
EP 1254918	B1	20040331		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2003048968	A	20030221	JP 2002-125613	2002 0426
<--				
JP 3848204	B2	20061122		
US 2003073804	A1	20030417	US 2002-133379	2002 0429
<--				

US 6855472 B2 20050215  
PRIORITY APPLN. INFO.: JP 2001-131693 A  
2001  
0427  
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JP 2001-131811 A  
2001  
0427  
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ED Entered STN: 08 Nov 2002

AB Polyhydroxyalkanoates are prepared from thienylsulfanyl alkanolic acids by microbial polymerization. The polyhydroxyalkanoates are useful as biodegradable charge control agents having excellent charging characteristics, excellent dispersibility in the toner resin and improved spent property. 5-(2-Thienylsulfanyl) valeric acid was cultured with *Pseudomonas cichorii* YN2 to give a polyhydroxyalkanoate.

L63 ANSWER 13 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:831899 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 137:343851

TITLE: Electrostatic charge image developing toner  
and image forming method

INVENTOR(S): Yano, Tetsuya; Nomoto, Tsuyoshi;

Kozaki, Shinya; Honma, Tsutomu

PATENT ASSIGNEE(S): Canon Kabushiki Kaisha,  
Japan

SOURCE: Eur. Pat. Appl., 80 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 3

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 1253475	A2	20021030	EP 2002-9673	2002 0429
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EP 1253475 A3 20031126

EP 1253475 B1 20070808

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,  
MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

JP 2003015359 A 20030117 JP 2001-210021  
2001  
0710

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PRIORITY APPLN. INFO.: JP 2001-133728 A  
2001  
0427

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JP 2001-210021 A  
2001  
0710

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OTHER SOURCE(S): MARPAT 137:343851

ED Entered STN: 01 Nov 2002

AB Electrostatic charge image developing toner allows to design the toner characteristics such as chargeability, flowability, stability in time and environmental stability uniform among the toners of different colors. The toner has a small particle size enough for enabling uniform dispersion and being excellent in color saturation and transparency. The toner also shows higher contribution to the environmental security. The toner includes a coloring agent of which at least a part of the surface is covered with polyhydroxyalkanoate (PHA). The toner is produced by dispersing the coloring agent in aqueous medium, then fixing PHA synthesizing enzyme to the coloring agent dispersed in the aqueous medium, then adding 3-hydroxyacyl CoA, and executing a PHA synthesizing reaction to cover at least a part of the surface of the coloring agent with PHA. The toner thus obtained is used for an image forming method.

L63 ANSWER 14 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:831842 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 137:331172

TITLE: Manufacture of biodegradable  
polyhydroxyalkanoates having phenylsulfanyl  
and/or phenylsulfonfyl terminal structure on  
side chains and their use as charge control  
agents in electrophotographic toner binder for  
image forming apparatus

INVENTOR(S): Imamura, Takeshi; Sugawa,  
Etsuko; Yano, Tetsuya;  
Kenmoku, Takashi  
PATENT ASSIGNEE(S): Canon Kabushiki Kaisha,  
Japan

SOURCE: Eur. Pat. Appl., 99 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1253162	A2	20021030	EP 2002-9675	2002 0429
<--				
EP 1253162	A3	20030226		
EP 1253162	B1	20060419		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2003034716	A	20030207	JP 2002-127700	2002 0426
<--				
JP 3880444	B2	20070214		
US 2003100700	A1	20030529	US 2002-133671	2002 0429
<--				
US 6808854	B2	20041026		
PRIORITY APPLN. INFO.: JP 2001-131831 A				
2001 0427				
<--				
JP 2001-133640 A				
2001 0427				
<--				

ED Entered STN: 01 Nov 2002

AB The present invention provides a novel polyhydroxyalkanoate (PHA) containing a 3-hydroxyalkanoic unit which has at its side chain terminal a substituted phenylsulfinyl group and/or a substituted phenylsulfonyl group, and a production process thereof. The novel PHA can be produced by oxidizing with a peroxide a biosynthetic PHA containing a 3-hydroxyalkanoic unit which has at its side chain terminal a substituted phenylsulfonyl group. The novel PHA has a superior function as a charge control agent, besides is biodegradable, hence is contributable to environmental conservation. Thus, a typical polymer was prepared by transforming 5-(phenylsulfonyl)valeric acid in a culture of *pseudomonas cichorii* YN2, followed by oxidizing the polyhydroxyalkanoate with H<sub>2</sub>O<sub>2</sub>.

L63 ANSWER 15 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:831841 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 137:326082

TITLE: Microbial preparation of polyhydroxyalkanoates  
for charge control agents and binders for  
toners

INVENTOR(S): Kenmoku, Takashi; Kobayashi, Toyoko;  
Sugawa, Etsuko; Yano, Tetsuya  
; Kobayashi, Shin; Imamura, Takeshi;  
Honma, Tsutomu

PATENT ASSIGNEE(S): Canon Kabushiki Kaisha,  
Japan

SOURCE: Eur. Pat. Appl., 83 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1253161	A2	20021030	EP 2002-9667	2002

0429

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EP 1253161 A3 20030226

EP 1253161 B1 20060322

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,  
MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

JP 2003034717 A 20030207 JP 2002-127588

2002

0426

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JP 3848206 B2 20061122

US 2003104300 A1 20030605 US 2002-133576

2002

0429

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US 6908720 B2 20050621

PRIORITY APPLN. INFO.: JP 2001-133651 A

2001

0427

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JP 2001-133667 A

2001

0427

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ED Entered STN: 01 Nov 2002

AB The present invention provides a polyhydroxyalkanoate (PHA) having a unit containing thioether with high reactivity, and its production method. The present invention also provides a charge control agent containing the PHA; a toner binder containing the charge control agent; an electrostatic latent image developing toner containing the charge control agent; and an image forming method and an image forming apparatus using the electrostatic latent image developing toner.

L63 ANSWER 16 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:831840 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 137:338415

TITLE: Preparation of microbial polyhydroxyalkanoates  
and their use in toners

INVENTOR(S): Honma, Tsutomu; Yano, Tetsuya;

Nomoto, Tsuyoshi; Kozaki, Shinya

PATENT ASSIGNEE(S): Canon Kabushiki Kaisha,  
Japan

SOURCE: Eur. Pat. Appl., 60 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 3

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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EP 1253160	A2	20021030	EP 2002-9695	
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2002

0429

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EP 1253160 A3 20031022

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,  
MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

JP 2003011312 A 20030115 JP 2001-208704

2001

0710

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JP 3684175 B2 20050817

PRIORITY APPLN. INFO.: JP 2001-131694 A

2001

0427

&lt;--

JP 2001-208704 A

2001

0710

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ED Entered STN: 01 Nov 2002

AB A construct comprises a base material and a polyhydroxyalkanoate, wherein at least a part of the base material is coated with the polyhydroxyalkanoate, and the polyhydroxyalkanoate comprises a 3-hydroxyalkanoic acid unit other than 3-hydroxypropionic acid unit, 3-hydroxy-n-butyric acid unit, and 3-hydroxy-n-valeric acid unit. A method for making a construct comprises: immobilizing a medium chain length

polyhydroxyalkanoate synthetase to a base material, and reacting 3-hydroxyacyl CoA with the synthetase to synthesize a polyhydroxyalkanoate and to coat at least a part of the base material with the polyhydroxyalkanoate. Polyhydroxyalkanoate synthetase was isolated from a transformant having polyhydroxyalkanoate synthetase production capacity, immobilized on alumina, and incubated with (R)-3-hydroxyoctanoyl CoA to give a polyhydroxyalkanoate.

L63 ANSWER 17 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:752333 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 137:263769

TITLE: Thienyl-containing polyhydroxyalkanoates  
prepared by microbial polymerization, and use  
in charge control agents, toner binders and  
image-forming apparatus

INVENTOR(S): Yano, Tetsuya; Sugawa,  
Etsuko; Imamura, Takeshi;  
Honma, Tsutomu; Kenmoku,  
Takashi

PATENT ASSIGNEE(S): Canon Kabushiki Kaisha,  
Japan

SOURCE: Eur. Pat. Appl., 83 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1245605	A2	20021002	EP 2002-7025	2002 0327
<--				
EP 1245605	A3	20030402		
EP 1245605	B1	20070314		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
US 2003096182	A1	20030522	US 2002-105305	2002 0326
<--				
US 6777153	B2	20040817		
JP 2003012786	A	20030115	JP 2002-89658	2002 0327
<--				
JP 3745298	B2	20060215		
PRIORITY APPLN. INFO.:			JP 2001-90026	A 2001 0327
<--				
		JP 2001-133551	A	2001 0427
<--				

ED Entered STN: 04 Oct 2002

AB The title polyhydroxyalkanoate comprise units represented by OCH<sub>2</sub>CH<sub>2</sub>CO, where R is (CH<sub>2</sub>)<sub>n</sub>COR<sub>1</sub>, R<sub>1</sub> is 2-thienyl, and n is 1 to 8. Also disclosed are a process for producing the polyhydroxyalkanoate by the use of a microorganism having the ability to produce the polyhydroxyalkanoate and accumulate it in the bacterial body; a charge control agent, a toner binder and a toner which contain this polyhydroxyalkanoate; and an image-forming method and an image-forming apparatus which make use of the toner.

L63 ANSWER 18 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:671943 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 137:224074

TITLE: Novel polyhydroxyalkanoate containing unit  
phenylsulfanyl structure in the side chain,  
process for its production, charge control  
agent, toner binder and toner which contain  
novel polyhydroxyalkanoate, and image-forming  
apparatus which make use of the toner

INVENTOR(S): Imamura, Takeshi; Sugawa,  
Etsuko; Yano, Tetsuya; Nomoto,  
Tsuyoshi; Suzuki, Tomohiro; Honma,

Tsutomu; Kenmoku, Takashi;  
Fukui, Tatsuki

PATENT ASSIGNEE(S): Canon Kabushiki Kaisha,  
Japan

SOURCE: Eur. Pat. Appl., 133 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1236755	A2	20020904	EP 2002-4759	2002 0301
<--				
EP 1236755	A3	20030402		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
US 2003013841	A1	20030116	US 2002-84172	2002 0228
<--				
US 7045321	B2	20060516		
JP 2003306534	A	20031031	JP 2002-56654	2002 0301
<--				
JP 3592306	B2	20041124		
US 2005250191	A1	20051110	US 2005-155599	2005 0620
<--				
PRIORITY APPLN. INFO.:			JP 2001-57142	A
			2001	
			0301	
<--				
			JP 2001-57145	A
			2001	
			0301	
<--				
			JP 2001-164774	A
			2001	
			0531	
<--				
			JP 2001-210037	A
			2001	
			0710	
<--				
			JP 2001-210049	A
			2001	
			0710	
<--				
			JP 2002-39254	A
			2002	
			0215	
<--				
			US 2002-84172	A3
			2002	
			0228	
<--				

ED Entered STN: 06 Sep 2002

AB A polyhydroxyalkanoate is disclosed which has, in the mol., a unit represented by  $\text{OCH}[(\text{CH}_2)_x\text{SC}_6\text{H}_4\text{R}]\text{CH}_2\text{CO}$ , wherein R is arbitrarily selected from a hydrogen atom, a halogen atom, CN, NO<sub>2</sub>, COOR', SO<sub>2</sub>R'', CH<sub>3</sub>, C<sub>2</sub>H<sub>5</sub>, C<sub>3</sub>H<sub>7</sub>, C(CH<sub>3</sub>)<sub>2</sub>H and C(CH<sub>3</sub>)<sub>3</sub>; where R' is H, Na, K, CH<sub>3</sub> or C<sub>2</sub>H<sub>5</sub>, and R'' is OH, ONa, OK, a halogen atom, OCH<sub>3</sub> or OC<sub>2</sub>H<sub>5</sub>; and x is an integer arbitrarily selected from 1 to 8; with the proviso that a polyhydroxyalkanoate is excluded which has a hydrogen atom as R and x in all the units is 2 or 4. Also disclosed is a process for producing the polyhydroxyalkanoate by the use of a microorganism having the ability to produce the polyhydroxyalkanoate and accumulate it in the bacterial body. This polyhydroxyalkanoate is useful as a biodegradable charge-control agent in electrophotog. toner binders. A typical polymer was manufactured by inoculating 200 mL Na<sub>2</sub>HPO<sub>4</sub> 6.2, K<sub>2</sub>HPO<sub>4</sub> 3.0, NaCl 0.5, and NH<sub>4</sub>Cl 1 g/L containing 0.5% polypeptone, 0.1% 5-(phenylthio)valeric acid with *Pseudomonas cichorii* strain YN2, and shaking 30 h.

L63 ANSWER 19 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2001:892025 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 136:19159

TITLE: Separation of poly(hydroxyalkanoic acids) from microbial cells

INVENTOR(S): Imamura, Takeshi; Kenmoku, Takashi; Suzuki, Tomohiro; Honma, Tsutomu; Nomoto, Takeshi; Sugawa, Etsuko; Yano, Tetsuya

PATENT ASSIGNEE(S): Canon Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2001340095	A	20011211	JP 2001-67254 2001 0309	
<--				
PRIORITY APPLN. INFO.:			JP 2000-88715 2000 0328	A
<--				

ED Entered STN: 11 Dec 2001

AB The polymers are separated from cells by microwave irradiation. *Ralstonia eutropha* TB 64 was cultured in a medium containing Na pyruvate to give cells containing poly(3-hydroxybutyric acid) (I), which was treated in a microwave oven, freeze-dried, extracted with  $\text{CHCl}_3$ , and washed with MeOH to give I with 87.1% purity and 85.9% recovery.

L63 ANSWER 20 OF 27 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2000:616368 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 133:206898

TITLE: Core-shell or multilayered polymer particles and their in situ manufacture with microorganisms

INVENTOR(S): Kawahata, Yuji; Imamura, Takeshi

PATENT ASSIGNEE(S): Canon Inc., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2000236892	A	20000905	JP 1999-39955 1999 0218	
<--				
PRIORITY APPLN. INFO.:			JP 1999-39955 1999 0218	
<--				

ED Entered STN: 06 Sep 2000

AB The particles, which might be useful for sustained-release pharmaceuticals, are manufactured by cultivation of microorganisms capable of producing polymer particles in the cells, in media containing materials for the polymers with changing the concns. and/or components of the materials. *Burkholderia cepacia* KK01 strain (FERM BP-4235) was cultured in a medium containing Na pyruvate, centrifuged, cultured in another medium containing Na valerate, centrifuged to collect the microorganism, and treated with NaOCl to manufacture perfectly spherical particles consisted of poly(3-hydroxybutyric acid) as the core and poly(3-hydroxyvaleric acid) as the shell.

L63 ANSWER 21 OF 27 BIOSIS COPYRIGHT (c) 2007 The Thomson

Corporation on STN

ACCESSION NUMBER: 2003:68616 BIOSIS [Full-text](#)

DOCUMENT NUMBER: PREV200300068616

TITLE: Method for producing microbial polyester.

AUTHOR(S): Imamura, Takeshi [Inventor, Reprint]

Author]; Yano, Tetsuya [Inventor];  
Kobayashi, Shin [Inventor]; Suda, Sakae [Inventor];  
Honma, Tsutomu [Inventor]

CORPORATE SOURCE: Chigasaki, Japan

ASSIGNEE: Canon Kabushiki  
Kaisha, Tokyo, Japan

PATENT INFORMATION: US 6492147 20021210

SOURCE: Official Gazette of the United States Patent and  
Trademark Office Patents, (Dec 10 2002)  
Vol. 1265, No. 2. <http://www.uspto.gov/web/menu/patdata.html>. e-file.

ISSN: 0098-1133 (ISSN print).

DOCUMENT TYPE: Patent

LANGUAGE: English

ENTRY DATE: Entered STN: 29 Jan 2003

Last Updated on STN: 29 Jan 2003

ED Entered STN: 29 Jan 2003

Last Updated on STN: 29 Jan 2003

AB A method for producing a microbial polyester by culturing a microorganism being capable of producing a poly hydroxyalkanoate polyester in a culture medium containing 1-hexene as a sole carbon source.

L63 ANSWER 22 OF 27 BIOSIS COPYRIGHT (c) 2007 The Thomson  
Corporation on STN

ACCESSION NUMBER: 2003:55194 BIOSIS [Full-text](#)

DOCUMENT NUMBER: PREV200300055194

TITLE: Polyhydroxyalkanoate synthase and gene  
encoding the same enzyme.

AUTHOR(S): Yano, Tetsuya [Inventor, Reprint Author];  
Imamura, Takeshi [Inventor]; Suda, Sakae  
[Inventor]; Honma, Tsutomu [Inventor]

CORPORATE SOURCE: Atsugi, Japan

ASSIGNEE: Canon Kabushiki  
Kaisha, Tokyo, Japan

PATENT INFORMATION: US 6485951 20021126

SOURCE: Official Gazette of the United States Patent and  
Trademark Office Patents, (Nov 26 2002)  
Vol. 1264, No. 4. <http://www.uspto.gov/web/menu/patdata.html>. e-file.

ISSN: 0098-1133 (ISSN print).

DOCUMENT TYPE: Patent

LANGUAGE: English

ENTRY DATE: Entered STN: 22 Jan 2003

Last Updated on STN: 22 Jan 2003

ED Entered STN: 22 Jan 2003

Last Updated on STN: 22 Jan 2003

AB A novel polyhydroxyalkanoate (PHA) synthase derived from a microorganism capable of producing a PHA having a novel side-chain structure and a DNA encoding the amino acid sequence for the synthase are provided. Two PHA synthase proteins (SEQ ID Nos. 1 and 3) derived from *Pseudomonas jessenii* P161 (FERM BP-7376) and PHA synthase genes encoding these PHA synthases are provided, respectively (SEQ ID Nos. 2 and 4). A recombinant microorganism is endowed with a PHA producing ability.

L63 ANSWER 23 OF 27 BIOSIS COPYRIGHT (c) 2007 The Thomson  
Corporation on STN

ACCESSION NUMBER: 2003:53351 BIOSIS [Full-text](#)

DOCUMENT NUMBER: PREV200300053351

TITLE: Polyhydroxyalkanoate containing  
3-hydroxythienylalkanoic acid as monomer unit and  
method for producing the same.

AUTHOR(S): Honma, Tsutomu [Inventor, Reprint  
Author]; Yano, Tetsuya [Inventor];  
Kobayashi, Shin [Inventor]; Imamura,  
Takeshi [Inventor]; Kenmoku, Takashi  
[Inventor]; Kozaki, Shinya [Inventor]

CORPORATE SOURCE: Atsugi, Japan

ASSIGNEE: Canon Kabushiki  
Kaisha, Tokyo, Japan

PATENT INFORMATION: US 6479621 20021112

SOURCE: Official Gazette of the United States Patent and  
Trademark Office Patents, (Nov 12 2002)  
Vol. 1264, No. 2. <http://www.uspto.gov/web/menu/patdata.html>. e-file.

ISSN: 0098-1133 (ISSN print).

DOCUMENT TYPE: Patent



LANGUAGE: English  
 ENTRY DATE: Entered STN: 22 Jan 2003  
 Last Updated on STN: 22 Jan 2003  
 ED Entered STN: 22 Jan 2003  
 Last Updated on STN: 22 Jan 2003

AB Microorganisms capable of synthesizing novel polyhydroxyalkanoate having 3-hydroxythienylalkanoic acid as monomer unit, using thienylalkanoic acid as a stock are cultured on a culture medium containing thienylalkanoic acid, and the polyhydroxyalkanoate produced in the cultured cell is extracted and

L63 ANSWER 24 OF 27 BIOSIS COPYRIGHT (c) 2007 The Thomson  
 Corporation on STN

ACCESSION NUMBER: 2001:192930 BIOSIS [Full-text](#)

DOCUMENT NUMBER: PREV200100192930

TITLE: *Pseudomonas cepacia* strain isolated from termite intestines that degrades trichloroethylene and furan compounds.

AUTHOR(S): Kato, Kiny [Inventor, Reprint author]; Kozaki, Shinya [Inventor]; Imamura, Takeshi [Inventor]; Sakuranaga, Masanori [Inventor]

CORPORATE SOURCE: Atsugi, Japan  
 ASSIGNEE: Canon Kabushiki Kaisha, Tokyo, Japan

PATENT INFORMATION: US 6096530 20000801  
 SOURCE: Official Gazette of the United States Patent and Trademark Office Patents, (Aug. 1, 2000)  
 Vol. 1237, No. 1. e-file.  
 CODEN: OGUPE7. ISSN: 0098-1133.

DOCUMENT TYPE: Patent

LANGUAGE: English  
 ENTRY DATE: Entered STN: 20 Apr 2001  
 Last Updated on STN: 18 Feb 2002

ED Entered STN: 20 Apr 2001

Last Updated on STN: 18 Feb 2002

AB A biologically pure culture of *Pseudomonas cepacia* strain KK01 (FERM BP-4235) is capable of degrading trichloroethylene. A method for obtaining microorganisms having a trichloroethylene degrading ability comprises the steps of culturing microorganisms separated from the bodies of termites in a culture medium. A method for remediating a soil contaminated with trichloroethylene comprises the steps of providing a soil contaminated with trichloroethylene and bringing microorganisms having a trichloroethylene degrading ability derived from intestine of termites into contact with the soil, and biodegrading trichloroethylene in the soil. A method for biodegrading trichloroethylene, comprises the steps of culturing *Pseudomonas cepacia* KK01 (FERM BP-4235) under existence of an inducer and inducing *Pseudomonas cepacia* KK01 (FERM BP-4235) to have ability for degrading trichloroethylene and bringing *Pseudomonas cepacia* KK01 having trichloroethylene degrading ability to contact with trichloroethylene and biodegrading trichloroethylene.

L63 ANSWER 25 OF 27 BIOSIS COPYRIGHT (c) 2007 The Thomson  
 Corporation on STN

ACCESSION NUMBER: 2000:331469 BIOSIS [Full-text](#)

DOCUMENT NUMBER: PREV200000331469

TITLE: Remedying a contaminated environment using *Pseudomonas cepacia* or *Corynebacterium* species and *Renobacter* species FERM BP-5353 having dehalogenase activity.

AUTHOR(S): Imamura, Takeshi [Inventor, Reprint author]; Yano, Tetsuy [Inventor]

CORPORATE SOURCE: Chigasaki, Japan  
 ASSIGNEE: Canon Kabushiki Kaisha, Tokyo, Japan

PATENT INFORMATION: US 6017746 20000125  
 SOURCE: Official Gazette of the United States Patent and Trademark Office Patents, (Jan. 25, 2000)  
 Vol. 1230, No. 4. e-file.  
 CODEN: OGUPE7. ISSN: 0098-1133.

DOCUMENT TYPE: Patent

LANGUAGE: English  
 ENTRY DATE: Entered STN: 2 Aug 2000  
 Last Updated on STN: 7 Jan 2002

ED Entered STN: 2 Aug 2000

Last Updated on STN: 7 Jan 2002

AB A process for remedying an environment contaminated with an aliphatic organochlorine compound which includes the use of *Pseudomonas cepacia* strain KK01 (FERM BP-4235) or *Corynebacterium* species (FERM BP 5102) and *Renobacter* species (FERM BP-5353). The first two microorganisms are capable of introducing an oxygen atom into the aliphatic organochlorine compound in order to convert the aliphatic compound to an epoxide. During protonization the epoxide is converted into a chlorinated organic acid. *Renobacter* species strain FERM BP-5353 decomposes chlorinated organic acids to substances naturally existing in nature. The chlorinated and/or halogenated acids include chloroacetic

acid, dichloroacetic acid, trichloroacetic acid and dichloropropionic acid, etc. The polluted environments in which the processes may be carried out include the soil, ground water and waste water.

L63 ANSWER 26 OF 27 BIOSIS COPYRIGHT (c) 2007 The Thomson

Corporation on STN

ACCESSION NUMBER: 2002:83352 BIOSIS [Full-text](#)

DOCUMENT NUMBER: PREV200200083352

TITLE: Bacterial KB2.

AUTHOR(S): Imamura, T. [Inventor]; Yano, T.

[Inventor]

CORPORATE SOURCE: Chigasaki, Japan

ASSIGNEE: CANON KABUSHIKI

KAISHA

PATENT INFORMATION: US 5665597 19970909

SOURCE: Official Gazette of the United States Patent and

Trademark Office Patents, (Sept. 9, 1997)

Vol. 1202, No. 2, pp. 1328. print.

CODEN: OGUPE7. ISSN: 0098-1133.

DOCUMENT TYPE: Patent

LANGUAGE: English

ENTRY DATE: Entered STN: 16 Jan 2002

Last Updated on STN: 25 Feb 2002

ED Entered STN: 16 Jan 2002

Last Updated on STN: 25 Feb 2002

L63 ANSWER 27 OF 27 BIOSIS COPYRIGHT (c) 2007 The Thomson

Corporation on STN

ACCESSION NUMBER: 2002:82147 BIOSIS [Full-text](#)

DOCUMENT NUMBER: PREV200200082147

TITLE: Method for biodegradation of polluting substance.

AUTHOR(S): Kato, K. [Inventor]; Tanaka, K. [Inventor];

Sakuranaga, M. [Inventor]; Kozaki, S.

[Inventor]

CORPORATE SOURCE: Yokohama, Japan

ASSIGNEE: CANON KABUSHIKI

KAISHA

PATENT INFORMATION: US 5658795 19970819

SOURCE: Official Gazette of the United States Patent and

Trademark Office Patents, (Aug. 19, 1997)

Vol. 1201, No. 3, pp. 2099. print.

CODEN: OGUPE7. ISSN: 0098-1133.

DOCUMENT TYPE: Patent

LANGUAGE: English

ENTRY DATE: Entered STN: 16 Jan 2002

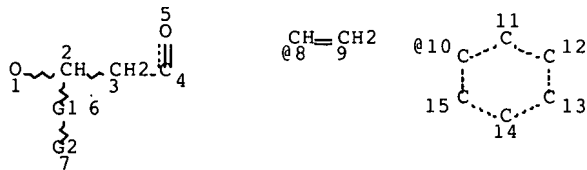
Last Updated on STN: 25 Feb 2002

ED Entered STN: 16 Jan 2002

Last Updated on STN: 25 Feb 2002

STRUCTURE SEARCH

=&gt; d his l52

(FILE 'HCAPLUS' ENTERED AT 11:04:52 ON 30 AUG 2007)  
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L4 STR

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VAR G2=8/10  
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CONNECT IS E1 RC AT 5  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 15

STEREO ATTRIBUTES: NONE

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L12 949 SEA FILE=HCAPLUS ABB=ON PLU=ON L6  
L14 57652 SEA FILE=HCAPLUS ABB=ON PLU=ON PSEUDOMONAS+PFT,OLD,NT  
/CT  
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L17 QUE ABB=ON PLU=ON POLYHYDROXYALKANOATE OR POLY(W)HYD  
ROXYALKANOATE OR POLY(W)HYDROXY(W)ALKANOATE  
L18 QUE ABB=ON PLU=ON COPOLYM? OR CO(W)POLYM?  
L19 QUE ABB=ON PLU=ON L17(3A)L18  
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L32 QUE ABB=ON PLU=ON KENMOKU T?/AU  
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L48 24 SEA FILE=HCAPLUS ABB=ON PLU=ON L23 AND L18  
L49 24 SEA FILE=HCAPLUS ABB=ON PLU=ON L48 OR L24

10/531,689

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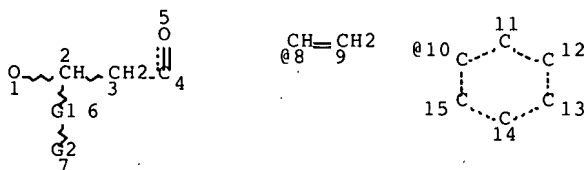
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(FILE 'MEDLINE, BIOSIS, DRUGU, EMBASE' ENTERED AT 11:14:08 ON 30  
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L62 4 S L56 NOT L61

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L4 STR



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VAR G2=8/10  
NODE ATTRIBUTES:  
CONNECT IS E1 RC AT 5  
DEFAULT MLEVEL IS ATOM  
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 15

STEREO ATTRIBUTES: NONE

L6 1299 SEA FILE=REGISTRY SSS FUL L4  
L10 20 SEA FILE=REGISTRY ABB=ON PLU=ON L6 AND (MEDLINE/LC  
OR BIOSIS/LC OR DRUGU/LC OR EMBASE/LC)  
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ROXYALKANOATE OR POLY(W)HYDROXY(W)ALKANOATE  
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L27 QUE ABB=ON PLU=ON SUGAWA E?/AU  
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L36 QUE ABB=ON PLU=ON L27 OR (L29 OR L30 OR L31 OR L32 O  
R L33 OR L34 OR L35)  
L38 QUE ABB=ON PLU=ON (CANON(W)KABUSHIKI?)/PA,CS,SO,CO  
L46 QUE ABB=ON PLU=ON PY<2003 OR PRY<2003 OR AY<2003 OR  
MY<2003 OR REVIEW/DT  
L53 67 SEA L10  
L54 3 SEA L53 AND L16  
L55 2 SEA L53 AND L17  
L56 4 SEA L54 OR L55  
L57 255 SEA L28  
L58 10077 SEA L36 OR L57  
L59 60 SEA L58 AND L38  
L60 34 SEA L59 AND (L16 OR L17)  
L61 7 SEA L60 AND L46  
L62 4 SEA L56 NOT L61

=> dup rem l52 l62

FILE 'HCAPLUS' ENTERED AT 11:23:35 ON 30 AUG 2007

USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.

10/531,689

PLEASE SEE "HELP USAGETERMS" FOR DETAILS.  
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FILE 'MEDLINE' ENTERED AT 11:23:35 ON 30 AUG 2007

FILE 'BIOSIS' ENTERED AT 11:23:35 ON 30 AUG 2007

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PROCESSING COMPLETED FOR L52

PROCESSING COMPLETED FOR L62

L64 15 DUP REM L52 L62 (0 DUPLICATES REMOVED)

ANSWERS '1-11' FROM FILE HCAPLUS

ANSWER '12' FROM FILE MEDLINE

ANSWERS '13-15' FROM FILE BIOSIS

## STRUCTURE SEARCH RESULTS

=&gt; d l64 1-11 ibib ed abs hitstr hitind

L64 ANSWER 1 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2001:912506 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 136:200571

TITLE: Preparation and Characterization of  
Enantiomerically Pure Telechelic Diols from  
mcl-Poly[(R)-3-hydroxyalkanoates]AUTHOR(S): Andrade, Austin P.; Witholt, Bernard; Hany,  
Roland; Egli, Thomas; Li, ZhiCORPORATE SOURCE: Institute of Biotechnology, ETH-Zuerich,  
Honggerberg, Zurich, CH-8093, Switz.SOURCE: Macromolecules (2002), 35(3),  
684-689

CODEN: MAMOBX; ISSN: 0024-9297

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 19 Dec 2001

AB Novel enantiomerically pure telechelic OH-terminated poly[(R)-3-hydroxyoctanoate] (PHO-diol), poly[(R)-3-hydroxyoctanoate-co-poly[(R)-3-hydroxy-7-oxooctanoate] (PHOO-diol), and poly[(R)-3-hydroxyoctanoate-co-poly[(R)-3-hydroxy-7-octenoate] (PHUO-diol) have been synthesized in 80-91% yield from the corresponding high mol. weight polymers, resp., by catalytic transesterification with ethylene glycol. The number average mol. wts. (Mn) of these telechelic diols reached (2.0-3.0) \* 10<sup>3</sup>, which corresponds to 17-20 repeated monomer units. For PHOO-diol and PHUO-diol, the side chain functional groups remained, which provides with addnl. reactive groups for further polymerization or modification. The structures of the diols were confirmed by 1H NMR and IR spectra. The glass transition temps. (Tg) of the telechelic diols are between -46 and -56 °C and the melting transition temps. (Tm) are lower than 40 °C, all determined by DSC. These telechelic diols can be used as soft-segments to prepare novel block copolymers with desired properties.

IT 401495-09-8, (R)-3-Hydroxyhexanoate-(R)-3-hydroxyoctanoate-  
(R)-3-Hydroxy-5-hexenoate-(R)-3-hydroxy-7-octenoate  
copolymer, ester with ethylene glycol (1:1)

RI: RCT (Reactant); RACT (Reactant or reagent)  
(preparation and characterization of enantiomerically pure  
telechelic diols from medium chain length-poly[(R)-3-  
hydroxyalkanoates])

RN 401495-09-8 HCAPLUS

CN 7-Octenoic acid, 3-hydroxy-, (3R)-, polymer with  
(3R)-3-hydroxyhexanoic acid, (3R)-3-hydroxy-5-hexenoic acid and  
(3R)-3-hydroxyoctanoic acid, 2-hydroxyethyl ester (9CI) (CA INDEX  
NAME)

CM 1

CRN 107-21-1

CMF C2 H6 O2



CM 2

CRN 128971-78-8

CMF (C8 H16 O3 . C8 H14 O3 . C6 H12 O3 . C6 H10 O3)x

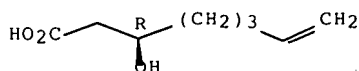
CCI PMS

CM 3

CRN 119003-50-8

CMF C8 H14 O3

Absolute stereochemistry.

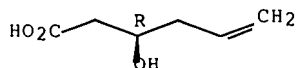


CM 4

CRN 119003-49-5

CMF C6 H10 O3

Absolute stereochemistry.

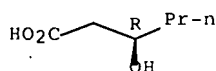


CM 5

CRN 77877-35-1

CMF C6 H12 O3

Absolute stereochemistry. Rotation (-).

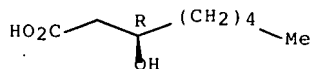


CM 6

CRN 44987-72-6

CMF C8 H16 O3

Absolute stereochemistry.



CC 35-8 (Chemistry of Synthetic High Polymers)

ST transesterification ethylene glycol telechelic enantiomerically pure polyhydroxyalkanoate diol synthesis

IT *Pseudomonas putida*

(GPol; preparation and characterization of enantiomerically pure telechelic diols from medium chain length-poly[(R)-3-hydroxyalkanoates])

IT 107-21-1, Ethylene glycol, reactions 401495-04-3,

(R)-3-Hydroxyhexanoate-(R)-3-hydroxyoctanoate copolymer, ester with ethylene glycol (1:1) 401495-06-5,

(R)-3-Hydroxyhexanoate-(R)-3-hydroxyoctanoate-(R)-3-Hydroxy-5-oxohexanoate-(R)-3-hydroxy-7-oxooctanoate copolymer, ester with ethylene glycol (1:1) 401495-09-8,

(R)-3-Hydroxyhexanoate-(R)-3-hydroxyoctanoate-(R)-3-Hydroxy-5-hexenoate-(R)-3-hydroxy-7-octenoate copolymer, ester with ethylene glycol (1:1)

RL: RCT (Reactant); RACT (Reactant or reagent)

(preparation and characterization of enantiomerically pure telechelic diols from medium chain length-poly[(R)-3-hydroxyalkanoates])

REFERENCE COUNT: 53 THERE ARE 53 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L64 ANSWER 2 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2001:921063 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 136:231306

TITLE: Genetically engineered *Pseudomonas*:  
A factory of new bioplastics with broad  
applicationsAUTHOR(S): Olivera, Elias R.; Carnicero, David; Jodra,  
Ruth; Minambres, Baltasar; Garcia, Belen;  
Abraham, Gustavo A.; Gallardo, Alberto; San  
Roman, Julio; Garcia, Jose L.; Naharro,  
German; Luengo, Jose M.CORPORATE SOURCE: Departamento de Bioquímica y Biología  
Molecular, Facultad de Veterinaria,  
Universidad de Leon, Leon, 24007, SpainSOURCE: Environmental Microbiology (2001),  
3(10), 612-618  
CODEN: ENMIFM; ISSN: 1462-2912

PUBLISHER: Blackwell Science Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 136:231306

ED Entered STN: 21 Dec 2001

AB New bioplastics containing aromatic or mixts. of aliphatic and aromatic monomers have been obtained using genetically engineered strains of *Pseudomonas putida*. The mutation (-) or deletion ( $\Delta$ ) of some of the genes involved in the  $\beta$ -oxidation pathway (fadA-, fadB-  $\Delta$ fadA or  $\Delta$ fadBA mutants) elicits a strong intracellular accumulation of unusual homo- or co -polymers that dramatically alter the morphol. of these bacteria, as more than 90% of the cytoplasm is occupied by these macromols. The introduction of a blockade in the  $\beta$ -oxidation pathway, or in other related catabolic routes, has allowed the synthesis of polymers other than those accumulated in the wild type (with regard to both monomer size and relative percentage), the accumulation of certain intermediates that are rapidly catabolized in the wild type and the accumulation in the culture broths of end metabolites that, as in the case of phenylacetic acid, phenylbutyric acid, trans-cinnamic acid or their derivs., have important medical or pharmaceutical applications (antitumoral, analgesic, radiopotentiators, chemopreventive or antihelminthic). Furthermore, using one of these polyesters (poly 3-hydroxy-6-phenylhexanoate), we obtained polymeric microspheres that could be used as drug vehicles.

IT 247169-46-6P 402956-11-0P 402956-12-1P

402956-13-2P 402956-14-3P 402956-15-4P

402956-16-5P

RL: BMF (Bioindustrial manufacture); BPN (Biosynthetic  
preparation); PRP (Properties); BIOL (Biological study); PREP  
(Preparation)(bioplastic production with genetically engineered  
*Pseudomonas*)

RN 247169-46-6 HCAPLUS

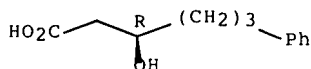
CN Benzenhexanoic acid,  $\beta$ -hydroxy-, ( $\beta$ R)-, homopolymer  
(9CI) (CA INDEX NAME)

CM 1

CRN 247169-45-5

CMF C12 H16 O3

Absolute stereochemistry.



RN 402956-11-0 HCAPLUS

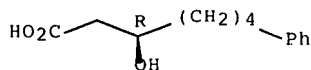
CN Benzenheptanoic acid,  $\beta$ -hydroxy-, ( $\beta$ R)-, polymer with  
( $\beta$ R)- $\beta$ -hydroxybenzenepentanoic acid, isotactic (9CI)  
(CA INDEX NAME)

CM 1

CRN 247169-47-7

CMF C13 H18 O3

Absolute stereochemistry.

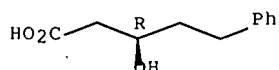




CM 2

CRN 153744-07-1  
CMF C11 H14 O3

Absolute stereochemistry.



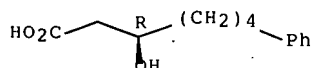
RN 402956-12-1 HCAPLUS

CN. Benzenheptanoic acid,  $\beta$ -hydroxy-, (BR)-, polymer with  
(BR)- $\beta$ -hydroxybenzenehexanoic acid and  
(BR)- $\beta$ -hydroxybenzenepentanoic acid, isotactic (9CI)  
(CA INDEX NAME)

CM 1

CRN 247169-47-7  
CMF C13 H18 O3

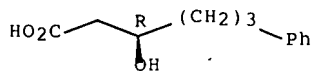
Absolute stereochemistry.



CM 2

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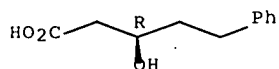
Absolute stereochemistry.



CM 3

CRN 153744-07-1  
CMF C11 H14 O3

Absolute stereochemistry.



RN 402956-13-2 HCAPLUS

CN Benzenooctanoic acid,  $\beta$ -hydroxy-, (BR)-, polymer with

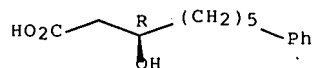
10/531,689

( $\beta$ R)- $\beta$ -hydroxybenzenhexanoic acid, isotactic (9Cl) (CA INDEX NAME)

CM 1

CRN 247169-51-3  
CMF C14 H20 O3

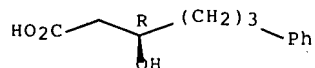
Absolute stereochemistry.



CM 2

CRN 247169-45-5  
CMF C12 H16 O3

Absolute stereochemistry.



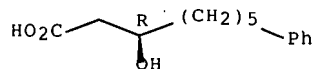
RN 402956-14-3 HCAPLUS

CN Benzeneoctanoic acid,  $\beta$ -hydroxy-, ( $\beta$ R)-, polymer with  
( $\beta$ R)- $\beta$ -hydroxybenzenheptanoic acid,  
( $\beta$ R)- $\beta$ -hydroxybenzenhexanoic acid and  
( $\beta$ R)- $\beta$ -hydroxybenzenepentanoic acid, isotactic (9Cl)  
(CA INDEX NAME)

CM 1

CRN 247169-51-3  
CMF C14 H20 O3

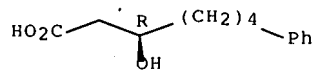
Absolute stereochemistry.



CM 2

CRN 247169-47-7  
CMF C13 H18 O3

Absolute stereochemistry.

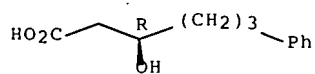


CM 3

10/531,689

CRN 247169-45-5  
CMF C12 H16 O3

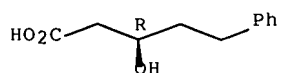
Absolute stereochemistry.



CM 4

CRN 153744-07-1  
CMF C11 H14 O3

Absolute stereochemistry.



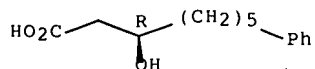
RN 402956-15-4 HCAPLUS

CN Benzeneoctanoic acid,  $\beta$ -hydroxy-, ( $\beta$ R)-, polymer with  
( $\beta$ R)- $\beta$ -hydroxybenzenhexanoic acid, (3R)-3-  
hydroxyhexanoic acid and (3R)-3-hydroxyoctanoic acid, isotactic  
(9CI) (CA INDEX NAME)

CM 1

CRN 247169-51-3  
CMF C14 H20 O3

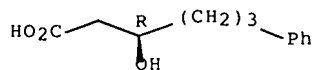
Absolute stereochemistry.



CM 2

CRN 247169-45-5  
CMF C12 H16 O3

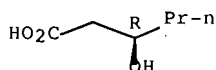
Absolute stereochemistry.



CM 3

CRN 77877-35-1  
CMF C6 H12 O3

Absolute stereochemistry. Rotation (-).

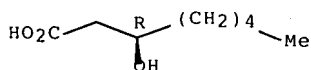


CM 4

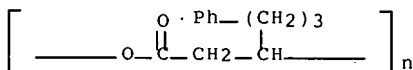
CRN 44987-72-6

CMF C8 H16 O3

Absolute stereochemistry.



RN 402956-16-5 HCAPLUS

CN Poly[oxy[(3R)-1-oxo-3-(3-phenylpropyl)-1,3-propanediyl]] (9CI)  
(CA INDEX NAME)

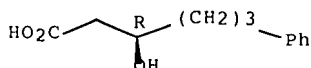
IT 247169-45-5

RL: BSU (Biological study, unclassified); BIOL (Biological study)  
(bioplastic production with genetically engineered  
*Pseudomonas*)

RN 247169-45-5 HCAPLUS

CN Benzenhexanoic acid,  $\beta$ -hydroxy-, ( $\beta$ R)- (9CI) (CA INDEX  
NAME)

Absolute stereochemistry.



CC 16-4 (Fermentation and Bioindustrial Chemistry)

ST *Pseudomonas* ferri polyhydroxyalkanoate prodn

IT Fermentation

Genetic engineering.

Glass transition temperature

Microspheres

Polydispersity

*Pseudomonas putida*

(bioplastic production with genetically engineered

*Pseudomonas*)

IT Gene, microbial

RL: BSU (Biological study, unclassified); BIOL (Biological study)

(fadB; bioplastic production with genetically engineered

*Pseudomonas*)

IT Gene, microbial

RL: BSU (Biological study, unclassified); BIOL (Biological study)

(fadD; bioplastic production with genetically engineered

*Pseudomonas*)

IT Polyesters, preparation  
 RL: BMF (Bioindustrial manufacture); BPN (Biosynthetic preparation); PRP (Properties); BIOL (Biological study); PREP (Preparation)  
 (hydroxycarboxylic acid-based; bioplastic production with genetically engineered *Pseudomonas*)

IT Mutagenesis  
 (transposon; bioplastic production with genetically engineered *Pseudomonas*)

IT 124-07-2, Octanoic acid, processes 142-62-1, Hexanoic acid, processes 156-38-7, 4-Hydroxy-phenylacetic acid 2270-20-4, 5-Phenylvaleric acid 5581-75-9, 6-Phenylhexanoic acid 26547-51-3, 8-Phenyloctanoic acid 40228-90-8, 7-Phenylheptanoic acid  
 RL: BCP (Biochemical process); BIOL (Biological study); PROC (Process)  
 (bioplastic production with genetically engineered *Pseudomonas*)

IT 247169-46-6P 402956-11-0P 402956-12-1P 402956-13-2P 402956-14-3P 402956-15-4P 402956-16-5P  
 RL: BMF (Bioindustrial manufacture); BPN (Biosynthetic preparation); PRP (Properties); BIOL (Biological study); PREP (Preparation)  
 (bioplastic production with genetically engineered *Pseudomonas*)

IT 247169-45-5  
 RL: BSU (Biological study, unclassified); BIOL (Biological study)  
 (bioplastic production with genetically engineered *Pseudomonas*)

REFERENCE COUNT: 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 3 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2001:180517 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 134:367300

TITLE: Microbial Synthesis of Poly( $\beta$ -hydroxyalkanoates) Bearing Phenyl Groups from *Pseudomonas putida*: Chemical Structure and Characterization

AUTHOR(S): Abraham, Gustavo A.; Gallardo, Alberto; San Roman, Julio; Olivera, Elias R.; Jodra, Ruth; Garcia, Belen; Minambres, Baltasar; Garcia, Jose L.; Luengo, Jose M.

CORPORATE SOURCE: Instituto de Ciencia y Tecnologia de Polimeros, CSIC, Madrid, 28006, Spain

SOURCE: Biomacromolecules (2001), 2(2), 562-567  
 CODEN: BOMAF6; ISSN: 1525-7797

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 16 Mar 2001

AB New poly( $\beta$ -hydroxyalkanoates) having aroms. groups (so-called PPhAs) from a microbial origin have been characterized. These polymers were produced and accumulated as reserve materials when a  $\beta$ -oxidation mutant of *Pseudomonas putida* U, disrupted in the gene that encodes the 3-ketoacyl-CoA thiolase (fadA), was cultured in a chemical defined medium containing different aromatic fatty acids (6-phenylhexanoic acid, 7-phenylheptanoic acid, a mixture of them, or 8-phenyloctanoic acid) as carbon sources. The polymers were extracted from the bacteria, purified and characterized by using <sup>13</sup>C NMR spectroscopy, gel permeation chromatog., and differential scanning calorimetry. Structural studies revealed that when 6-phenylhexanoic acid was added to the cultures, an homopolymer (poly-3-hydroxy-6-phenylhexanoate) was accumulated. The feeding with 8-phenyloctanoic acid and 7-phenylheptanoic acid leads to the formation of copolymers of the corresponding units with the n - 2 carbons formed after deacetylation, copoly(3-hydroxy-8-phenyloctanoate-3-hydroxy-6-phenylhexanoate) and copoly(3-hydroxy-7-phenylheptanoate-3-hydroxy-5-phenylvalerate), resp. The mixture of 6-phenylhexanoic acid and 7-phenylheptanoic acid gave rise to the corresponding terpolymer, copoly(3-hydroxy-7-phenylheptanoate-3-hydroxy-6-phenylhexanoate-3-hydroxy-5-phenylvalerate). Studies on the chemical structure of these three polyesters revealed that they were true copolymers but not a mixture of homopolymers and that the different monomeric units were randomly incorporated in the macromol. chains. Thermal behavior and mol. weight distribution were also discussed. These compds. had a dual attractive interest in function of (i) their broad use as biodegradable polymers and (ii) their possible biomedical applications.

IT 172923-04-5P 247169-52-4P 340255-66-5P 340255-71-2P 340255-73-4P

RL: SPN (Synthetic preparation); PREP (Preparation)  
 (microbial preparation of polyesters containing Ph group with *Pseudomonas putida*)

RN 172923-04-5 HCAPLUS

CN Benzenepentanoic acid,  $\beta$ -hydroxy-, (BR)-, homopolymer,

10/531,689

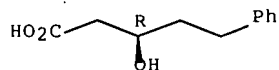
isotactic (9CI) (CA INDEX NAME)

CM 1

CRN 153744-07-1

CMF C11 H14 O3

Absolute stereochemistry.



RN 247169-52-4 HCAPLUS

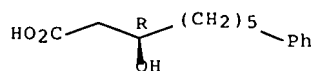
CN Benzenooctanoic acid,  $\beta$ -hydroxy-, ( $\beta$ R)-, polymer with  
( $\beta$ R)- $\beta$ -hydroxybenzenhexanoic acid (9CI) (CA INDEX  
NAME)

CM 1

CRN 247169-51-3

CMF C14 H20 O3

Absolute stereochemistry.

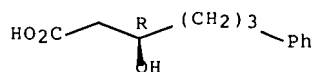


CM 2

CRN 247169-45-5

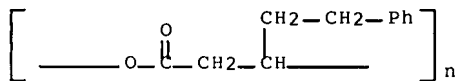
CMF C12 H16 O3

Absolute stereochemistry.



RN 340255-66-5 HCAPLUS

CN Poly[oxy[(3R)-1-oxo-3-(2-phenylethyl)-1,3-propanediyl]] (9CI) (CA  
INDEX NAME)



RN 340255-71-2 HCAPLUS

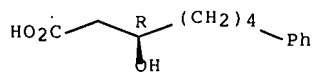
CN Benzenheptanoic acid,  $\beta$ -hydroxy-, ( $\beta$ R)-, polymer with  
( $\beta$ R)- $\beta$ -hydroxybenzenepentanoic acid (9CI) (CA INDEX  
NAME)

CM 1

CRN 247169-47-7

CMF C13 H18 O3

Absolute stereochemistry.

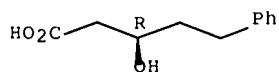


CM 2

CRN 153744-07-1

CMF C11 H14 O3

Absolute stereochemistry.



RN 340255-73-4 HCAPLUS

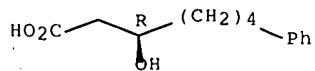
CN Benzenheptanoic acid,  $\beta$ -hydroxy-, ( $\beta$ R)-, polymer with  
 ( $\beta$ R)- $\beta$ -hydroxybenzenhexanoic acid and  
 ( $\beta$ R)- $\beta$ -hydroxybenzenepentanoic acid (9CI) (CA INDEX  
 NAME)

CM 1

CRN 247169-47-7

CMF C13 H18 O3

Absolute stereochemistry.

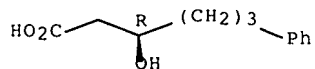


CM 2

CRN 247169-45-5

CMF C12 H16 O3

Absolute stereochemistry.

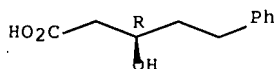


CM 3

CRN 153744-07-1

CMF C11 H14 O3

Absolute stereochemistry.



CC 35-5 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 10

ST microbial polyhydroxyalkanoate phenyl contg prepn  
characterization; *Pseudomonas putida* polyester prepn  
characterization; phenylhexanoic acid microbial polyester prepn;  
phenylheptanoic acid microbial polyester prepn; phenyloctanoic  
acid microbial polyester prepn

IT *Pseudomonas putida*

(in preparation of polyesters containing Ph group)

IT Polyesters, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)  
(microbial preparation of polyesters containing Ph group with  
*Pseudomonas putida*)

IT 172923-04-5P 247169-52-4P 340255-66-5P

340255-71-2P 340255-73-4P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(microbial preparation of polyesters containing Ph group with  
*Pseudomonas putida*)

REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L64 ANSWER 4 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2001:856979 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 136:196742

TITLE: Intracellular degradation of two structurally  
different polyhydroxyalkanoic acids  
accumulated in *Pseudomonas putida*  
and *Pseudomonas citronellolis* from  
mixtures of octanoic acid and 5-phenylvaleric  
acid

AUTHOR(S): Chung, Dong Min; Choi, Mun Hwan; Song, Jae  
Jun; Yoon, Sung Chul; Kang, Inn-Kyu; Huh, Nam  
Eung

CORPORATE SOURCE: Biomaterials Science Laboratory, Division of  
Applied Life Sciences at The Graduate School,  
Gyeongsang National University, Jinju,  
660-701, S. Korea

SOURCE: International Journal of Biological  
Macromolecules (2001), 29(4-5),  
243-250  
CODEN: IJBMDR; ISSN: 0141-8130

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 27 Nov 2001

AB From a set of mixed carbon sources, 5-phenylvaleric acid (PV) and octanoic acid (OA), polyhydroxyalkanoic acid (PHA) was sep. accumulated in the two pseudomonads *Pseudomonas putida* BM01 and *Pseudomonas citronellolis* (ATCC 13674) to investigate any structural difference between the two PHA accumulated under a similar culture condition using one-step culture technique. The resulting polymers were isolated by chloroform solvent extraction and characterized by fractional precipitation and differential scanning calorimetry. The solvent fractionation anal. showed that the PHA synthesized by *P. putida* was separated into two fractions, 3-hydroxy-5-phenylvalerate (3HPV)-rich PHA fraction in the precipitate phase and 3-hydroxyoctanoate (3HO)-rich PHA fraction in the solution phase whereas the PHA produced by *P. citronellolis* exhibited a rather little compositional separation into the two phases. According to the thermal anal., the *P. putida* PHA exhibited two glass transitions indicative of the PHA not being homogeneous whereas the *P. citronellolis* PHA exhibited only one glass transition. It was found that the structural heterogeneity of the *P. putida* PHA was caused by a significant difference in the assimilation rate between PV and OA. The structural heterogeneity present in the *P. putida* PHA was also confirmed by a first order degradation kinetics anal. of the PHA in the cells. The two different first-order degradation rate consts. ( $k_1$ ), 0.087 and 0.015/h for 3HO- and 3HPV-unit, resp., were observed in a polymer system over the first 20 h of degradation. In the later degradation period, the disappearance rate of 3HO-unit was calculated to be 0.020 h. The  $k_1$  value of 0.083/h, almost the same as for the 3HO-unit in the *P. putida* PHA, was obtained for the P(3HO) accumulated in *P. putida* BM01 grown on OA as the only carbon source. In addition, the  $k_1$  value of 0.015/h for the 3HPV-unit in the *P. putida* PHA, was also close to 0.019/h for the P(3HPV) homopolymer accumulated in *P. putida* BM01 grown on PV plus butyric acid. On the contrary, the  $k_1$  values for the *P. citronellolis* PHA were determined to be 0.035 and 0.029/h for 3HO- and 3HPV-unit, resp., thus these two relatively close values implying a random copolymer nature of the *P. citronellolis* PHA. In addition, the faster degradation of P(3HO) than P(3HPV) by the intracellular *P. putida* PHA depolymerase indicates that the enzyme is more specific against the aliphatic PHA than the aromatic PHA.

IT 129645-03-0P 134736-36-0P 401612-76-8P

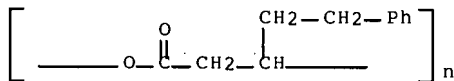
RL: BSU (Biological study, unclassified); PEP (Physical,



engineering or chemical process); PRP (Properties); PUR  
(Purification or recovery); BIOL. (Biological study); PREP  
(Preparation); PROC (Process)  
(intracellular degradation of two structurally different  
polyhydroxyalkanoic acids accumulated in *Pseudomonas*  
*putida* and *P. citronellolis* from mixts. of octanoic acid and  
phenylvaleric acid)

RN 129645-03-0 HCAPLUS

CN Poly[oxy[1-oxo-3-(2-phenylethyl)-1,3-propanediyl]] (9CI) (CA  
INDEX NAME)



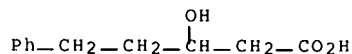
RN 134736-36-0 HCAPLUS

CN Benzenepentanoic acid,  $\beta$ -hydroxy-, homopolymer (9CI) (CA  
INDEX NAME)

CM 1

CRN 41479-99-6

CMF C11 H14 O3



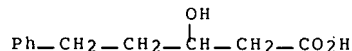
RN 401612-76-8 HCAPLUS

CN Benzenepentanoic acid,  $\beta$ -hydroxy-, polymer with  
3-hydroxyoctanoic acid (CA INDEX NAME)

CM 1

CRN 41479-99-6

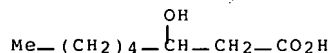
CMF C11 H14 O3



CM 2

CRN 14292-27-4

CMF C8 H16 O3



CC 10-2 (Microbial, Algal, and Fungal Biochemistry)

ST polyhydroxyalkanoate accumulation structure biodegrdn

*Pseudomonas*; octanoate phenylvalerate

polyhydroxyalkanoate accumulation *Pseudomonas*

IT Decomposition kinetics

(biodegrdn.; intracellular degradation of two structurally  
different polyhydroxyalkanoic acids accumulated in

*Pseudomonas putida* and *P. citronellolis* from mixts. of octanoic acid and phenylvaleric acid)

IT Carbon sources, microbial

Glass transition

*Pseudomonas citronellolis*

*Pseudomonas putida*

(intracellular degradation of two structurally different polyhydroxyalkanoic acids accumulated in *Pseudomonas putida* and *P. citronellolis* from mixts. of octanoic acid and phenylvaleric acid)

IT Polyesters, biological studies

RL: BSU (Biological study, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); PUR (Purification or recovery); BIOL (Biological study); PREP (Preparation); PROC (Process)

(intracellular degradation of two structurally different polyhydroxyalkanoic acids accumulated in *Pseudomonas putida* and *P. citronellolis* from mixts. of octanoic acid and phenylvaleric acid)

IT 124-07-2, Octanoic acid, biological studies 2270-20-4, 5-Phenylvaleric acid 140208-16-8, Polyhydroxyalkanoate depolymerase

RL: BSU (Biological study, unclassified); BIOL (Biological study)

(intracellular degradation of two structurally different polyhydroxyalkanoic acids accumulated in *Pseudomonas putida* and *P. citronellolis* from mixts. of octanoic acid and phenylvaleric acid)

IT 86175-71-5P 120659-38-3P, Poly 3 hydroxyoctanoic acid 129645-03-0P 134736-36-0P 401612-76-8P

RL: BSU (Biological study, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); PUR (Purification or recovery); BIOL (Biological study); PREP (Preparation); PROC (Process)

(intracellular degradation of two structurally different polyhydroxyalkanoic acids accumulated in *Pseudomonas putida* and *P. citronellolis* from mixts. of octanoic acid and phenylvaleric acid)

REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 5 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2000:309693 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 133:57635

TITLE: PhaG-mediated synthesis of poly(3-hydroxyalkanoates) consisting of medium-chain-length constituents from nonrelated carbon sources in recombinant *Pseudomonas fragi*

AUTHOR(S): Fiedler, Silke; Steinbuchel, Alexander; Rehm, Bernd H. A.

CORPORATE SOURCE: Institut für Mikrobiologie, Westfälische Wilhelms-Universität Münster, Münster, D-48149, Germany

SOURCE: Applied and Environmental Microbiology (2000), 66(5), 2117-2124  
CODEN: AEMIDF; ISSN: 0099-2240

PUBLISHER: American Society for Microbiology

DOCUMENT TYPE: Journal

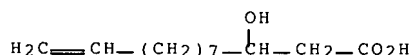
LANGUAGE: English

ED Entered STN: 14 May 2000

AB Recently, a new metabolic link between fatty acid de novo biosynthesis and biosynthesis of poly(3-hydroxyalkanoate) consisting of medium-chain-length constituents (C6 to C14) (PHAMCL), catalyzed by the 3-hydroxydecanoyl-[acyl-carrier-protein]:CoA transacylase (PhaG), has been identified in *Pseudomonas putida*. To establish this PHA-biosynthetic pathway in a non-PHA-accumulating bacterium, phaC1 (encoding PHA synthase 1) from *Pseudomonas aeruginosa* and phaG (encoding the transacylase) from *P. putida* were functionally coexpressed in *Pseudomonas fragi*. The recombinant strains of *P. fragi* were cultivated on gluconate as the sole carbon source, and PHA accumulation to about 14% of the total cellular dry weight was achieved. The resp. polyester was isolated, and GPC anal. revealed a weight average molar mass of about 130,000 g mol<sup>-1</sup> and a polydispersity of 2.2. The PHA was composed mainly (60 mol%) of 3-hydroxydecanoate. These data strongly suggested that functional expression of phaC1 and phaG established a new pathway for PHAMCL biosynthesis from nonrelated carbon sources in *P. fragi*. When fatty acids were used as the carbon source, no PHA accumulation was observed in PHA synthase-expressing *P. fragi*, whereas application of the  $\beta$ -oxidation inhibitor acrylic acid mediated PHAMCL accumulation. The substrate for the PHA synthase PhaC1 is therefore presumably directly provided through the enzymic activity of the transacylase PhaG by the conversion of (R)-3-hydroxydecanoyl-ACP to (R)-3-hydroxydecanoyl-CoA when the organism is cultivated on gluconate. Here we demonstrate for the first time the establishment of PHAMCL synthesis from nonrelated carbon

sources in a non-PHA-accumulating bacterium, employing fatty acid de novo biosynthesis and the enzymes PhaG (a transacylase) and PhaC (a PHA synthase).

- IT 278185-67-4DP, copolymer with  
polyhydroxyalkanoates  
RL: BMF (Bioindustrial manufacture); BPN (Biosynthetic preparation); BSU (Biological study, unclassified); MFM (Metabolic formation); BIOL (Biological study); FORM (Formation, nonpreparative); PREP (Preparation)  
(PhaG-mediated synthesis of medium chain length poly(3-hydroxyalkanoates) from nonrelated carbon sources in recombinant *Pseudomonas fragi*)  
RN 278185-67-4 HCAPLUS  
CN 11-Dodecenoic acid, 3-hydroxy- (9CI) (CA INDEX NAME)



- CC 16-4 (Fermentation and Bioindustrial Chemistry)  
Section cross-reference(s): 3, 10  
ST *Pseudomonas* recombinant prodn  
polyhydroxyalkanoates carbon sources  
IT Genetic engineering  
(PhaG-mediated synthesis of medium chain length poly(3-hydroxyalkanoates) from nonrelated carbon sources in recombinant *Pseudomonas fragi*)  
IT Gene, microbial  
RL: BAC (Biological activity or effector, except adverse); BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)  
(PhaG; PhaG-mediated synthesis of medium chain length poly(3-hydroxyalkanoates) from nonrelated carbon sources in recombinant *Pseudomonas fragi*)  
IT Polyesters, biological studies  
RL: BMF (Bioindustrial manufacture); BPN (Biosynthetic preparation); BSU (Biological study, unclassified); MFM (Metabolic formation); BIOL (Biological study); FORM (Formation, nonpreparative); PREP (Preparation)  
(hydroxycarboxylic acid-based; PhaG-mediated synthesis of medium chain length poly(3-hydroxyalkanoates) from nonrelated carbon sources in recombinant *Pseudomonas fragi*)  
IT Promoter (genetic element)  
RL: BAC (Biological activity or effector, except adverse); BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)  
(lacP; PhaG-mediated synthesis of medium chain length poly(3-hydroxyalkanoates) from nonrelated carbon sources in recombinant *Pseudomonas fragi*)  
IT Plasmids  
(pBHR86; PhaG-mediated synthesis of medium chain length poly(3-hydroxyalkanoates) from nonrelated carbon sources in recombinant *Pseudomonas fragi*)  
IT Gene, microbial  
RL: BAC (Biological activity or effector, except adverse); BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)  
(phaC1; PhaG-mediated synthesis of medium chain length poly(3-hydroxyalkanoates) from nonrelated carbon sources in recombinant *Pseudomonas fragi*)  
IT *Pseudomonas fragi*  
(recombinant; PhaG-mediated synthesis of medium chain length poly(3-hydroxyalkanoates) from nonrelated carbon sources in recombinant *Pseudomonas fragi*)  
IT Oxidation  
(β-, pathway; PhaG-mediated synthesis of medium chain length poly(3-hydroxyalkanoates) from nonrelated carbon sources in recombinant *Pseudomonas fragi*)  
IT 79-10-7, Acrylic acid, biological studies  
RL: ADV (Adverse effect, including toxicity); BAC (Biological activity or effector, except adverse); BSU (Biological study,

unclassified); BIOL (Biological study)

(PhaG-mediated synthesis of medium chain length poly(3-hydroxyalkanoates) from nonrelated carbon sources in recombinant *Pseudomonas fragi*)

IT 300-85-6DP, 3-Hydroxybutyric acid, copolymer with polyhydroxyalkanoates 1883-13-2DP, 3-Hydroxydodecanoic acid, copolymer with polyhydroxyalkanoates 1961-72-4DP, 3-Hydroxytetradecanoic acid, copolymer with polyhydroxyalkanoates 10191-24-9DP, 3-Hydroxyhexanoic acid, copolymer with polyhydroxyalkanoates 14292-26-3DP, 3-Hydroxydecanoic acid, copolymer with polyhydroxyalkanoates 14292-27-4DP, 3-Hydroxyoctanoic acid, copolymer with polyhydroxyalkanoates 278185-67-4DP, copolymer with polyhydroxyalkanoates

RL: BMF (Bioindustrial manufacture); BPN (Biosynthetic preparation); BSU (Biological study, unclassified); MFM (Metabolic formation); BIOL (Biological study); FORM (Formation, nonpreparative); PREP (Preparation)

(PhaG-mediated synthesis of medium chain length poly(3-hydroxyalkanoates) from nonrelated carbon sources in recombinant *Pseudomonas fragi*)

IT 50-99-7, D-Glucose, biological studies 56-81-5, 1,2,3-Propanetriol, biological studies 77-92-9, biological studies 112-80-1, Oleic acid, biological studies 334-48-5, Decanoic acid 526-95-4, D-Gluconic acid 12125-02-9, Ammonium chloride, biological studies

RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)

(PhaG-mediated synthesis of medium chain length poly(3-hydroxyalkanoates) from nonrelated carbon sources in recombinant *Pseudomonas fragi*)

IT 215314-08-2

RL: BAC (Biological activity or effector, except adverse); BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)

(PhaG; PhaG-mediated synthesis of medium chain length poly(3-hydroxyalkanoates) from nonrelated carbon sources in recombinant *Pseudomonas fragi*)

IT 134688-88-3

RL: BAC (Biological activity or effector, except adverse); BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)

(phaC1; PhaG-mediated synthesis of medium chain length poly(3-hydroxyalkanoates) from nonrelated carbon sources in recombinant *Pseudomonas fragi*)

REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L64 ANSWER 6 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1999:112134 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 130:267855

TITLE: Chemical modification of poly(hydroxyalkanoates). Copolymers bearing pendant sugars

AUTHOR(S): Constantin, Marieta; Simionescu, Cristofer I.; Carpov, Adrian; Samain, Eric; Driguez, Hugues

CORPORATE SOURCE: Centre Recherches Macromolecules Vegetales, Joseph Fourier Univ., Grenoble, F-38041, Fr.

SOURCE: Macromolecular Rapid Communications (1999), 20(2), 91-94

CODEN: MRCOE3; ISSN: 1022-1336

PUBLISHER: Wiley-VCH Verlag GmbH

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 18 Feb 1999

AB Copolymers of poly(3-hydroxyoctanoates) (PHAs) containing repeating units with unsatd. or brominated pendant side chains were obtained from cultures of *Pseudomonas oleovorans* grown on mixts. of octanoic acid and undecenoic acid or 11-bromoundecanoic acid as carbon sources. These polymers, bearing reactive functionalities, were used to graft acetylated maltosyl units either by anti-Markovnikov addition to the double bond or SN2 substitution of the halogen. De-O-acetylation of the sugar moieties yielded PHAs with new properties.

IT 201933-09-7P

RL: PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation);

## PROC (Process)

(preparation and characterization of poly(3-hydroxyoctanoates)  
grafted with acetylated maltose derivs.)

RN 201933-09-7 HCAPLUS

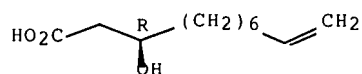
CN 10-Undecenoic acid, 3-hydroxy-, (3R)-, polymer with  
(3R)-3-hydroxyoctanoic acid, isotactic (9CI) (CA INDEX NAME)

CM 1

CRN 198274-26-9

CMF C11 H20 O3

Absolute stereochemistry.

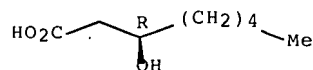


CM 2

CRN 44987-72-6

CMF C8 H16 O3

Absolute stereochemistry.



IT 201933-09-7DP, reaction products with acetyl-1-thio-β-  
maltose

RL: PRP (Properties); SPN (Synthetic preparation); PREP  
(Preparation)

(preparation and characterization of poly(3-hydroxyoctanoates)  
grafted with acetylated maltose derivs.)

RN 201933-09-7 HCAPLUS

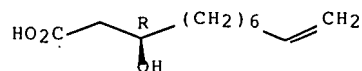
CN 10-Undecenoic acid, 3-hydroxy-, (3R)-, polymer with  
(3R)-3-hydroxyoctanoic acid, isotactic (9CI) (CA INDEX NAME)

CM 1

CRN 198274-26-9

CMF C11 H20 O3

Absolute stereochemistry.

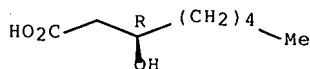


CM 2

CRN 44987-72-6

CMF C8 H16 O3

Absolute stereochemistry.



CC 35-8 (Chemistry of Synthetic High Polymers)

ST polyhydroxyalkanoate grafting acetylated maltose  
characterization

IT 201933-09-7P 222043-80-3P

RL: PEP (Physical, engineering or chemical process); PRP  
(Properties); SPN (Synthetic preparation); PREP (Preparation);  
PROC (Process)

(preparation and characterization of poly(3-hydroxyoctanoates)  
grafted with acetylated maltose derivs.)

IT 2592-37-2DP, reaction products with hydroxyoctanoic  
acid-hydroxy-undecenoic acid copolymer 53270-66-9DP,  
reaction products with hydroxyoctanoic acid-bromo-  
hydroxyundecanoic acid copolymer 201933-09-7DP

, reaction products with acetyl-1-thio-β-maltose  
222043-80-3DP, reaction products with acetyl-1-S-acetyl-thio-  
β-maltose

RL: PRP (Properties); SPN (Synthetic preparation); PREP  
(Preparation)

(preparation and characterization of poly(3-hydroxyoctanoates)  
grafted with acetylated maltose derivs.)

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L64 ANSWER 7 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1996:84591 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 124:115514

TITLE: Production of poly(3-hydroxyalkanoates)  
containing aromatic substituents by  
*Pseudomonas oleovorans*

AUTHOR(S): Curley, Joanne M.; Hazer, Baki; Lenz, Robert  
W.

CORPORATE SOURCE: Department of Polymer Science and Engineering,  
University of Massachusetts, Amherst, MA,  
01003, USA

SOURCE: Macromolecules (1996), 29(5), 1762-6  
CODEN: MAMOBX; ISSN: 0024-9297

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 09 Feb 1996

AB *P. oleovorans* was grown sep. on 5-(4'-tolyl)valeric acid, 5-(4'-ethylphenyl)valeric acid, 5-(4'-biphenyl)valeric acid, and 8-(4'-tolyl)octanoic acid  
either as the sole C source or as a cofeed with either nonanoic acid or 5-phenylvaleric acid. For polymer production, 5-(4'-tolyl)valeric acid was the  
most effective growth substrate of the 5. It resulted in the production of poly-3-hydroxy-5-(4'-tolyl)valerate, a crystalline polymer with a glass  
transition temperature of 18° and a melting transition of 95°. This poly(3-hydroxyalkanoate) (PHA) is apparently the 1st example of a crystalline  
aromatic-containing bacterial PHA. When *P. oleovorans* was cofed an equimolar mixture of 5-phenylvaleric acid and 5-(4'-tolyl)valeric acid, the  
polymer produced contained 36 mol% of 3-hydroxy-5-phenylvalerate and 64 mol% of 3-hydroxy-5-(4'-tolyl)valerate, and it did not crystallize.

IT 172923-04-5P 172923-06-7P 172923-07-8P  
172923-08-9P

RL: BPN (Biosynthetic preparation); PRP (Properties); BIOL  
(Biological study); PREP (Preparation)

(production of poly(3-hydroxyalkanoates) containing aromatic substituents  
by *Pseudomonas oleovorans*)

RN 172923-04-5 HCAPLUS

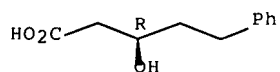
CN Benzenepentanoic acid, β-hydroxy-, (βR)-, homopolymer,  
isotactic (9CI) (CA INDEX NAME)

CM 1

CRN 153744-07-1

CMF C11 H14 O3

Absolute stereochemistry.



RN 172923-06-7 HCAPLUS

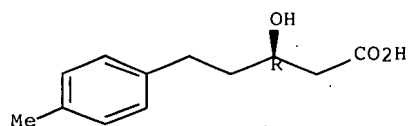
CN Benzenepentanoic acid,  $\beta$ -hydroxy-4-methyl-, (R)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 172923-05-6

CMF C12 H16 O3

Absolute stereochemistry.



RN 172923-07-8 HCAPLUS

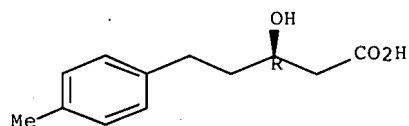
CN Benzenepentanoic acid,  $\beta$ -hydroxy-4-methyl-, (R)-, polymer with (R)-3-hydroxynonanoic acid (9CI) (CA INDEX NAME)

CM 1

CRN 172923-05-6

CMF C12 H16 O3

Absolute stereochemistry.

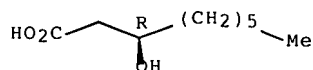


CM 2

CRN 33796-87-1

CMF C9 H18 O3

Absolute stereochemistry.



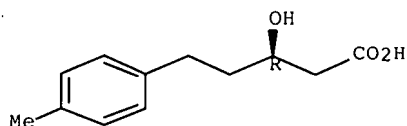
RN 172923-08-9 HCAPLUS

CN Benzenepentanoic acid,  $\beta$ -hydroxy-4-methyl-, (R)-, polymer with (R)- $\beta$ -hydroxybenzenepentanoic acid (9CI) (CA INDEX NAME)

CM 1

CRN 172923-05-6  
CMF C12 H16 O3

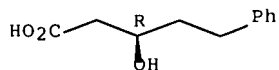
Absolute stereochemistry.



CM 2

CRN 153744-07-1  
CMF C11 H14 O3

Absolute stereochemistry.



CC 16-4 (Fermentation and Bioindustrial Chemistry)

Section cross-reference(s): 35

ST arom polyhydroxyalkanoate prodn *Pseudomonas*;  
tolyl valerate phenylvalerate hydroxy copolymer  
*Pseudomonas*

IT *Pseudomonas oleovorans*

(production of poly(3-hydroxyalkanoates) containing aromatic substituents  
by *Pseudomonas oleovorans*)

IT Polyesters, preparation

RL: BPN (Biosynthetic preparation); BIOL (Biological study); PREP  
(Preparation)

(hydroxycarboxylic acid-based, production of poly(3-  
hydroxyalkanoates) containing aromatic substituents by  
*Pseudomonas oleovorans*)

IT 172923-04-5P 172923-06-7P 172923-07-8P

172923-08-9P

RL: BPN (Biosynthetic preparation); PRP (Properties); BIOL  
(Biological study); PREP (Preparation)

(production of poly(3-hydroxyalkanoates) containing aromatic substituents  
by *Pseudomonas oleovorans*)

IT 777-93-5P 51994-31-1P, [1,1'-Biphenyl]-4-pentanoic acid

89326-69-2P, Benzenepentanoic acid, 4-ethyl- 101100-52-1P

RL: BPR (Biological process); BSU (Biological study,  
unclassified); SPN (Synthetic preparation); BIOL (Biological  
study); PREP (Preparation); PROC (Process)

(production of poly(3-hydroxyalkanoates) containing aromatic substituents  
by *Pseudomonas oleovorans*)

L64 ANSWER 8 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1997:120979 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 126:235770

TITLE: Scanning electron microscopy of  
polyhydroxyalkanoate degradation by  
bacteria

AUTHOR(S): Molitoris, H. P.; Moss, S. T.; De Koning, G.  
J. M.; Jendrosseck, D.

CORPORATE SOURCE: Inst. Botanik, Univ. Regensburg, Regensburg,  
D-93040, Germany

SOURCE: Applied Microbiology and Biotechnology (  
1996), 46(5/6), 570-579

CODEN: AMBIDG; ISSN: 0175-7598

PUBLISHER: Springer

DOCUMENT TYPE: Journal



LANGUAGE: English

ED Entered STN: 21 Feb 1997

AB Bacterial degradation of sheets of selected polyhydroxyalkanoates by *Comamonas* sp., *Pseudomonas lemoignei* and *Pseudomonas fluorescens* GK13 is reported. Five natural polyhydroxyalkanoates were used, namely poly(3-hydroxybutyrate), poly(3-hydroxyvalerate), a copolymer of 3-hydroxybutyrate and 3-hydroxyvalerate, a copolymer of mainly 3-hydroxyoctanoate and minor amts. of 3-hydroxyhexanoate, and two rubber-like copolymers of saturated and unsatd. hydroxyalkanoic acids that were modified by electron-beam-induced crosslinking. Each of these polymers was degraded by at least one bacterial strain, the rate of hydrolysis being dependent on the surface area of the polymer exposed to attack. SEM of partially degraded samples showed that hydrolysis started at the surface and at phys. lesions in the polymer and proceeded to the inner part of the material. No evidence for areas of non-degradable polymer was found for any of the polymers analyzed, even if the polymer contained chemical cross-links.

IT 128971-78-8

RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)  
(SEM of polyhydroxyalkanoate degradation by bacteria)

RN 128971-78-8 HCAPLUS

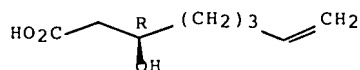
CN 7-Octenoic acid, 3-hydroxy-, (R)-, polymer with  
(R)-3-hydroxyhexanoic acid, (R)-3-hydroxy-5-hexenoic acid and  
(R)-3-hydroxyoctanoic acid (9CI) (CA INDEX NAME)

CM 1

CRN 119003-50-8

CMF C8 H14 O3

Absolute stereochemistry.

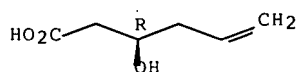


CM 2

CRN 119003-49-5

CMF C6 H10 O3

Absolute stereochemistry.

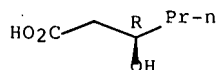


CM 3

CRN 77877-35-1

CMF C6 H12 O3

Absolute stereochemistry. Rotation (-).

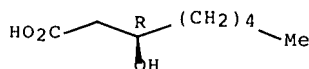


CM 4

CRN 44987-72-6

CMF C8 H16 O3

Absolute stereochemistry.



CC 10-2 (Microbial, Algal, and Fungal Biochemistry)

Section cross-reference(s): 35

ST polyhydroxyalkanoate degradn bacteria SEM

IT Bacteria (Eubacteria)

Comamonas

Pseudomonas

Scanning electron microscopy

(SEM of polyhydroxyalkanoate degradation by bacteria)

IT Decomposition

(biodegradn.; SEM of polyhydroxyalkanoate degradation by bacteria)

IT Polymer degradation

(biol.; SEM of polyhydroxyalkanoate degradation by bacteria)

IT Polyesters, biological studies

RL: BPR (Biological process); BSU (Biological study, unclassified); RCT (Reactant); BIOL (Biological study); PROC (Process); RACT (Reactant or reagent)

(hydroxycarboxylic acid-based; SEM of polyhydroxyalkanoate degradation by bacteria)

IT 128971-78-8 141455-97-2 141901-08-8 154994-48-6

155075-32-4 160555-53-3 262373-27-3

RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)

(SEM of polyhydroxyalkanoate degradation by bacteria)

L64 ANSWER 9 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1996:352644 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 125:53235

TITLE: Sequential production of two different polyesters in the inclusion bodies of *Pseudomonas oleovorans*

AUTHOR(S): Curley, Joanne M.; Lenz, Robert W.; Fuller, R. Clinton

CORPORATE SOURCE: Dep. Polym. Sci. Eng., Univ. Massachusetts, Amherst, MA, 01003, USA

SOURCE: International Journal of Biological Macromolecules (1996), 19(1), 29-34  
CODEN: IJBMDR; ISSN: 0141-8130

PUBLISHER: Elsevier

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 18 Jun 1996

AB When *Pseudomonas oleovorans* was grown on a mixture of 5-phenylvaleric acid, PVA, and nonanoic acid, NA, the reserve polyester produced included both a homopolymer and a copolymer. The homopolymer poly-3-hydroxy-5-phenylvalerate, PHPV, contained only 3-hydroxy-5-phenylvalerate units, while the copolymer contained the same long-chain 3-hydroxyalkanoates as those present in the copolymer poly-3-hydroxynonanoate, PHN, which is produced from nonanoic acid alone. The intracellular location of each of these polymers was determined by selective staining of the inclusion body granules with ruthenium tetroxide and examination by transmission electron microscopy showed that both types of polyesters occurred in the same granule. PHN was present in the center of the granule, while PHPV accumulated around the PHN in the inclusion body. The proteins associated with the inclusion bodies were separated using sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE). In all cases, two different polymerase enzymes of mol. weight 59 and 55 KDa were present, indicating that the same polymerase enzyme system was responsible for the production of both PHN and PHPV. Attempts were made to produce a random copolymer containing both alkyl and phenylalkyl repeat units by varying the growth conditions, but a mixture of PHN and PHPV was always produced instead.

IT 134736-36-0P

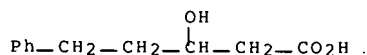
RL: BOC (Biological occurrence); BSU (Biological study, unclassified); MFM (Metabolic formation); PRP (Properties); PUR (Purification or recovery); BIOL (Biological study); FORM (Formation, nonpreparative); OCCU (Occurrence); PREP (Preparation)  
(sequential production of 2 different polyesters in the inclusion bodies of *Pseudomonas oleovorans*)

RN 134736-36-0 HCAPLUS

CN Benzenepentanoic acid,  $\beta$ -hydroxy-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 41479-99-6  
CMF C11 H14 O3



- CC 10-2 (Microbial, Algal, and Fungal Biochemistry)  
ST polyester sequential formation *Pseudomonas* inclusion body; polyhydroxyalkanoate sequential formation *Pseudomonas* inclusion body  
IT Inclusion bodies  
    *Pseudomonas oleovorans*  
    (sequential production of 2 different polyesters in the inclusion bodies of *Pseudomonas oleovorans*)  
IT 134688-88-3, Hydroxyalkanoate polymerase  
    RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); BIOL (Biological study)  
    (sequential production of 2 different polyesters in the inclusion bodies of *Pseudomonas oleovorans*)  
IT 120659-39-4P 134736-36-0P  
    RL: BOC (Biological occurrence); BSU (Biological study, unclassified); MFM (Metabolic formation); PRP (Properties); PUR (Purification or recovery); BIOL (Biological study); FORM (Formation, nonpreparative); OCCU (Occurrence); PREP (Preparation)  
    (sequential production of 2 different polyesters in the inclusion bodies of *Pseudomonas oleovorans*)  
IT 112-05-0, Nonanoic acid 2270-20-4, 5-Phenylvaleric acid  
    RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)  
    (sequential production of 2 different polyesters in the inclusion bodies of *Pseudomonas oleovorans*)

1.64 ANSWER 10 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1990:516180 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 113:116180

TITLE: Physical characteristics of  
poly(3-hydroxyalkanoates) and  
poly(3-hydroxyalkenoates) produced by  
*Pseudomonas oleovorans* grown on  
aliphatic hydrocarbons

AUTHOR(S): Preusting, Hans; Nijenhuis, Atze; Witholt,  
Bernard

CORPORATE SOURCE: Groningen Biotechnol. Cent., Univ. Groningen,  
Groningen, 9747 AG, Neth.

SOURCE: Macromolecules (1990), 23(19),  
4220-4

CODEN: MAMOBX; ISSN: 0024-9297

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 29 Sep 1990

AB *Pseudomonas oleovorans* accumulated poly(3-hydroxyalkanoates) (PHAs) after growth on n-alkanes and 1-alkenes. The composition and phys. characteristics of these polyesters were substrate dependent. When n-alkanes (n-hexane to n-decane) were used, PHAs were formed consisting of 3-hydroxyalkanoate monomers of which the pendant group varied from a Me to a heptyl group (saturated PHAs). When 1-alkenes (1-octene and 1-decene) were used as the carbon source, the polyester consisted of both 3-hydroxyalkanoate and terminally unsatd. 3-hydroxyalkenoate monomers, of which the pendant group varied in length between a Pr and a heptyl group (unsatd. PHAs). The structure of the PHAs was confirmed by <sup>1</sup>H and <sup>13</sup>C NMR. Apart from the PHAs isolated from n-hexane and 1-alkene grown cells, the copolymers were partly crystalline ( $\Delta H_m = 6.6-18.7$  J/g), having m.ps. which varied between 38.9 and 58.5° and glass temps. (T<sub>g</sub>) from -30.8 to -39.7°. The T<sub>g</sub>'s of the amorphous polymers ranged from -25.8 to -43.1°. The mol. wts. of the isolated polymers ranged from 178,000 to 330,000.

IT 128971-78-8P 128999-53-1P

RL: BPN (Biosynthetic preparation); PRP (Properties); BIOL (Biological study); PREP (Preparation)  
(biochem. preparation and structure of, from *Pseudomonas oleovorans*, effect of feed substrate on)

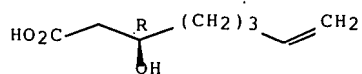
RN 128971-78-8 HCAPLUS

CN 7-Octenoic acid, 3-hydroxy-, (R)-, polymer with  
(R)-3-hydroxyhexanoic acid, (R)-3-hydroxy-5-hexenoic acid and  
(R)-3-hydroxyoctanoic acid (9CI) (CA INDEX NAME)

CM 1

CRN 119003-50-8  
CMF C8 H14 O3

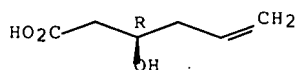
Absolute stereochemistry.



CM 2

CRN 119003-49-5  
CMF C6 H10 O3

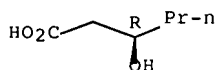
Absolute stereochemistry.



CM 3

CRN 77877-35-1  
CMF C6 H12 O3

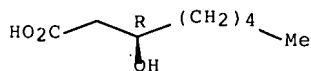
Absolute stereochemistry. Rotation (-).



CM 4

CRN 44987-72-6  
CMF C8 H16 O3

Absolute stereochemistry.



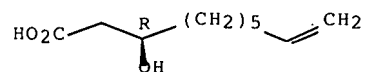
RN 128999-53-1 HCAPLUS

CN 9-Decenoic acid, 3-hydroxy-, (R)-, polymer with  
(R)-3-hydroxydecanoic acid, (R)-3-hydroxyhexanoic acid,  
(R)-3-hydroxy-5-hexenoic acid, (R)-3-hydroxynonanoic acid,  
(R)-3-hydroxyoctanoic acid and (R)-3-hydroxy-7-octenoic acid (9CI)  
(CA INDEX NAME)

CM 1

CRN 119003-52-0  
CMF C10 H18 O3

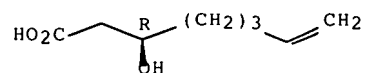
Absolute stereochemistry.



CM 2

CRN 119003-50-8  
CMF C8 H14 O3

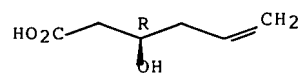
Absolute stereochemistry.



CM 3

CRN 119003-49-5  
CMF C6 H10 O3

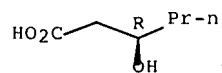
Absolute stereochemistry.



CM 4

CRN 77877-35-1  
CMF C6 H12 O3

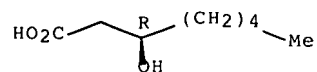
Absolute stereochemistry. Rotation (-).



CM 5

CRN 44987-72-6  
CMF C8 H16 O3

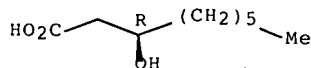
Absolute stereochemistry.



CM 6

CRN 33796-87-1  
CMF C9 H18 O3

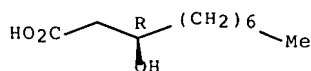
Absolute stereochemistry.



CM 7

CRN 19525-80-5  
CMF C10 H20 O3

Absolute stereochemistry. Rotation (-).



CC 36-2 (Physical Properties of Synthetic High Polymers)

Section cross-reference(s): 35

ST **Pseudomonas** oleovorans polyhydroxyalkanoate

structure property

IT Polyesters, preparation

RL: BPN (Biosynthetic preparation); BIOL (Biological study); PREP (Preparation)

(biochem. preparation of, from **Pseudomonas** oleovorans, feed substrate effect on structure in relation to)

IT Crystallinity

Glass temperature and transition

(of biochem. prepared poly(hydroxyalkanoates))

IT **Pseudomonas** oleovorans

(polyhydroxyalkanoates produced from, structure of, feed substrate effect on)

IT 128971-75-5P 128971-76-6P 128971-77-7P 128971-78-8P  
128999-52-0P 128999-53-1P 174793-36-3P

RL: BPN (Biosynthetic preparation); PRP (Properties); BIOL (Biological study); PREP (Preparation)

(biochem. preparation and structure of, from **Pseudomonas** oleovorans, effect of feed substrate on)

IT 110-54-3, Hexane, properties 111-65-9, Octane, properties

111-66-0, 1-Octene 111-84-2, Nonane 124-18-5, Decane

142-82-5, Heptane, properties 872-05-9, 1-Decene

RL: BAC (Biological activity or effector, except adverse); BSU

(Biological study, unclassified); PRP (Properties); BIOL

(Biological study)

(substrate, for biochem. production of poly(

hydroxyalkanoates) from **Pseudomonas**

oleovorans, structure in relation to)

L64 ANSWER 11 OF 15 HCAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 1989:91797 HCAPLUS [Full-text](#)

DOCUMENT NUMBER: 110:91797

TITLE:

Formation of polyesters by **Pseudomonas** oleovorans: effect of substrates on formation and composition of poly-(R)-3-hydroxyalkanoates and poly-(R)-3-hydroxyalkanoatesAUTHOR(S): Lageveen, Roland G.; Huisman, Gjaltrik W.;  
Preusting, Hans; Ketelaar, Peter; Eggink,

Gerrit; Witholt, Bernard

CORPORATE SOURCE: Groningen Biotechnol. Cent., Univ. Groningen,  
Groningen, 9747 AG, Neth.

SOURCE: Applied and Environmental Microbiology (

1988), 54(12), 2924-32

CODEN: AEMIDF; ISSN: 0099-2240

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 17 Mar 1989

AB P. oleovorans grows on C6 to C12 n-alkanes and 1-alkenes. These substrates are oxidized to the corresponding fatty acids, which are oxidized further via the  $\beta$ -oxidation pathway, yielding shorter fatty acids which have lost one or more C2 units. P. oleovorans normally utilizes  $\beta$ -oxidation pathway intermediates for growth, but in this study, the intermediate 3-hydroxy fatty acids can also be polymerized to intracellular poly-(R)-3-hydroxyalkanoates (PHAs) when the medium contains limiting amts. of essential elements, such as nitrogen. The monomer composition of these polyesters is a reflection of the substrates used for growth of P. oleovorans. The largest monomer found in PHAs always contained as many C atoms as did the n-alkane used as a substrate. Monomers which were shorter by one or more C2 units were also observed. Thus, for C-even substrates, only C-even monomers were found, with (R)-3-hydroxyheptanoate as the smallest monomer. 1-Alkenes were also incorporated into PHAs, albeit less efficiently and with lower yields than n-alkanes. These PHAs contained both saturated and unsatd. monomers, apparently because the 1-alkene substrates could be oxidized to carboxylic acids at either the saturated or the unsatd. ends. Up to 55% of the PHA monomers contained terminal double bonds when P. oleovorans was grown on 1-alkenes. The degree of unsatn. of PHAs could be modulated by varying the ratio of alkenes to alkanes in the growth medium. Since 1-alkenes were also shortened before being polymerized, as was the case for n-alkanes, copolymers which varied with respect to both monomer chain length and the percentage of terminal double bonds were formed during nitrogen-limited growth of P. oleovorans on 1-alkenes. Such polymers are expected to be useful for future chemical modifications.

IT 119003-49-5 119003-50-8 119003-51-9

119003-52-0

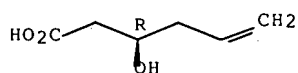
RL: BIOL (Biological study)

(in polyester formed by *Pseudomonas oleovorans*)

RN 119003-49-5 HCAPLUS

CN 5-Hexenoic acid, 3-hydroxy-, (3R)- (9CI) (CA INDEX NAME)

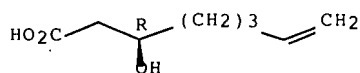
Absolute stereochemistry.



RN 119003-50-8 HCAPLUS

CN 7-Octenoic acid, 3-hydroxy-, (R)- (9CI) (CA INDEX NAME)

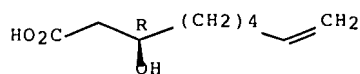
Absolute stereochemistry.



RN 119003-51-9 HCAPLUS

CN 8-Nonenoic acid, 3-hydroxy-, (3R)- (CA INDEX NAME)

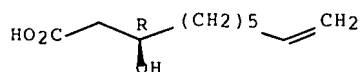
Absolute stereochemistry.



RN 119003-52-0 HCAPLUS

CN 9-Decenoic acid, 3-hydroxy-, (R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



CC 10-2 (Microbial Biochemistry)  
 ST polyester formation *Pseudomonas*  
 polyhydroxyalkanoate polyhydroxyalkenoate  
 IT Polyesters, biological studies  
 RL: BIOL (Biological study)  
 (in polyester formed by *Pseudomonas oleovorans*)  
 IT Alkanes, biological studies  
 Alkenes, biological studies  
 RL: BPR (Biological process); BSU (Biological study,  
 unclassified); BIOL (Biological study); PROC (Process)  
 (metabolism of, by *Pseudomonas oleovorans*, polyesters  
 formation in relation to)  
 IT *Pseudomonas oleovorans*  
 (polyhydroxyalkanoates and polyhydroxyalkenoates  
 formation by, substrates effect on)  
 IT 7787-35-1 19525-80-5 28254-78-6 33796-87-1 44987-72-6  
 85233-44-9 97961-62-1 119003-49-5 119003-50-8  
 119003-51-9 119003-52-0  
 RL: BIOL (Biological study)  
 (in polyester formed by *Pseudomonas oleovorans*)  
 IT 110-54-3, Hexane, biological studies 111-65-9, Octane,  
 biological studies 111-66-0, 1-Octene 111-84-2, Nonane  
 112-40-3, Dodecane 112-41-4, 1-Dodecene 124-11-8, 1-Nonene  
 124-18-5, Decane 142-82-5, Heptane, biological studies  
 592-41-6, 1-Hexene, biological studies 872-05-9, 1-Decene  
 1120-21-4, Undecane  
 RL: BPR (Biological process); BSU (Biological study,  
 unclassified); BIOL (Biological study); PROC (Process)  
 (metabolism of, by *Pseudomonas oleovorans*, polyesters  
 formation in relation to)

=> d 164 12-15 ibib ed ab hit ind

L64 ANSWER 12 OF 15 MEDLINE on STN  
 ACCESSION NUMBER: 91175643 MEDLINE [Full-text](#)  
 DOCUMENT NUMBER: PubMed ID: 2078535  
 TITLE: Production of unsaturated polyesters by  
*Pseudomonas oleovorans*.  
 AUTHOR: Fritzsche K; Lenz R W; Fuller R C  
 CORPORATE SOURCE: Department of Polymer Science and Engineering,  
 University of Massachusetts, Amherst 01003.  
 SOURCE: International journal of biological macromolecules,  
 (1990 Apr) Vol. 12, No. 2, pp. 85-91.  
 Journal code: 7909578. ISSN: 0141-8130.  
 PUB. COUNTRY: ENGLAND: United Kingdom  
 DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
 (RESEARCH SUPPORT, U.S. GOVT, NON-P.H.S.)  
 LANGUAGE: English  
 FILE SEGMENT: Priority Journals  
 ENTRY MONTH: 199105  
 ENTRY DATE: Entered STN: 19 May 1991  
 Last Updated on STN: 19 May 1991  
 Entered Medline: 1 May 1991  
 ED Entered STN: 19 May 1991  
 Last Updated on STN: 19 May 1991  
 Entered Medline: 1 May 1991

AB *Pseudomonas oleovorans* was grown separately on 3-hydroxy-6-octenoic acid and 3-hydroxy-7-octenoic acid as the only carbon source and under ammonium nutrient-limiting conditions to produce storage polyesters. The polyesters produced contained mainly unsaturated C8 units. Small amounts of both the saturated and the unsaturated C6 units were also present, but only about 1% of the saturated 3-hydroxyoctanoate units was detected. The polyester obtained from 3-hydroxy-6-octenoic acid, which was a mixture of the cis and trans isomers, also contained units with cis and trans double bonds. The weight average molecular weights of the polymers produced were in the range of 339,000-383,000 as determined by g.p.c. relative to polystyrene, with Mw/Mn ratios of 1.8-2.1. The mechanism of PHA formation from n-octene previously reported is discussed in relation to the present results, and the two were found to be in good agreement.  
 TI Production of unsaturated polyesters by *Pseudomonas*  
*oleovorans*.



AB *Pseudomonas oleovorans* was grown separately on 3-hydroxy-6-octenoic acid and 3-hydroxy-7-octenoic acid as the only carbon source and under ammonium nutrient-limiting conditions to produce storage polyesters. The polyesters produced contained mainly unsaturated C8 units. Small amounts of both the saturated and the unsaturated C6 units were also present, but only about 1% of the saturated 3-hydroxyoctanoate units was detected. The polyester obtained from 3-hydroxy-6-octenoic acid, which was a mixture of the cis and trans isomers, also contained units with cis and trans double bonds. The weight average molecular weights of the polymers produced were in the range of 339,000-383,000 as determined by g.p.c. relative to polystyrene, with Mw/Mn ratios of 1.8-2.1. The mechanism of PHA formation from n-octene previously reported is discussed in relation to the present results, and the two were found to be in good agreement.

CT Culture Media

\*Fatty Acids, Monounsaturated: ME, metabolism

\*Hydroxy Acids: ME, metabolism

Macromolecular Substances

Magnetic Resonance Spectroscopy

Molecular Weight

\*Polymers: ME, metabolism

*Pseudomonas*: GD, growth & development

\**Pseudomonas*: ME, metabolism

RN 120676-01-9 (3-hydroxy-7-octenoic acid); 128940-64-7

(3-hydroxy-6-octenoic acid)

CT Culture Media

\*Fatty Acids, Monounsaturated: ME, metabolism

\*Hydroxy Acids: ME, metabolism

Macromolecular Substances

Magnetic Resonance Spectroscopy

Molecular Weight

\*Polymers: ME, metabolism

*Pseudomonas*: GD, growth & development

\**Pseudomonas*: ME, metabolism

RN 120676-01-9 (3-hydroxy-7-octenoic acid); 128940-64-7

(3-hydroxy-6-octenoic acid)

CN 0 (Culture Media); 0 (Fatty Acids, Monounsaturated); 0 (Hydroxy Acids); 0 (Macromolecular Substances); 0 (Polymers)

L64 ANSWER 13 OF 15 BIOSIS COPYRIGHT (c) 2007 The Thomson Corporation on STN

ACCESSION NUMBER: 2005:401806 BIOSIS [Full-text](#)

DOCUMENT NUMBER: PREV200510189913

TITLE: Molecular characterization of extracellular  
— medium-chain-length poly(3-hydroxyalkanoate)  
depolymerase genes from *Pseudomonas*  
*alcaligenes* strains.

AUTHOR(S): Kim, Do Young; Kim, Hyun Chul; Kim, Sun Young;  
Rhee, Young Ha [Reprint Author]

CORPORATE SOURCE: Chungnam Natl Univ, Sch Biosci and Biotechnol, Dept  
Microbiol, Taejeon 305764, South Korea  
yhrhee@cnu.ac.kr

SOURCE: Journal of Microbiology, (JUN 2005) Vol. 43, No. 3,  
pp. 285-294.  
ISSN: 1225-8873.

DOCUMENT TYPE: Article

LANGUAGE: English

ENTRY DATE: Entered STN: 5 Oct 2005

Last Updated on STN: 5 Oct 2005

ED Entered STN: 5 Oct 2005

Last Updated on STN: 5 Oct 2005

AB A bacterial strain M4-7 capable of degrading various polyesters, such as poly( $\epsilon$ -caprolactone), poly(3-hydroxybutyrate-co-3-hydroxyvalerate), poly(3-hydroxyoctanoate), and poly(3-hydroxy-5-phenylvalerate), was isolated from a marine environment and identified as *Pseudomonas alcaligenes*. The relative molecular mass of a purified extracellular medium-chain-length poly(3-hydroxyalkanoate) (MCL-PRA) depolymerase (PhaZ(PalM4-7)) from *P. alcaligenes* M4-7 was 28.0 kDa, as determined by SDS-PAGE. The PhaZ(PalM4-7) was most active in 50 mM glycine-NaOH buffer (pH 9.0) at 35 degrees C. It was insensitive to dithiothreitol, sodium azide, and iodoacetamide, but susceptible to p-hydroxymercuribenzoic acid, N-bromosuccinimide, acetic anhydride, EDTA, diisopropyl fluorophosphate, phenylmethylsulfonyl fluoride, Tween 80, and Triton X-100. In this study, the genes encoding MCL-PHA depolymerase were cloned, sequenced, and characterized from a soil bacterium, *P. alcaligenes* LB19 (Kim et al., 2002, *Biomacromolecules* 3, 291-296) as well as *P. alcaligenes* M4-7. The structural gene (PhaZ(PalLB19)) of MCL-PHA depolymerase of *P. alcaligenes* LB19 consisted of an 837 bp open reading frame (ORF) encoding a protein of 278 amino acids with a deduced M-r of 30,188 Da. However, the MCL-PHA depolymerase gene (phaZ(PalM4-7)) of *P. alcaligenes* M4-7 was composed of an 834 bp ORF encoding a protein of 277 amino acids with a deduced M-r of 30,323 Da. Amino acid sequence analyses showed that, in the two different polypeptides, a substrate-binding domain and a catalytic domain are located in the N-terminus and in the C-terminus, respectively. The PhaZ(PalM4-7) and the PhaZ(PalLB19) commonly share the lipase box, GISSG in their catalytic domains, and utilize (111)Asn and (110)Ser residues, respectively, as oxyanions that play an important role in transition-state stabilization of hydrolytic reactions.

TI Molecular characterization of extracellular medium-chain-length  
poly(3-hydroxyalkanoate) depolymerase genes from  
*Pseudomonas alcaligenes* strains.

AB A bacterial strain M4-7 capable of degrading various polyesters, such as poly( $\epsilon$ -caprolactone), poly(3-hydroxybutyrate-co-3-hydroxyvalerate), poly(3-hydroxyoctanoate), and poly(3-hydroxy-5-phenylvalerate), was isolated from a marine environment and identified as *Pseudomonas alcaligenes*. The relative molecular mass of a purified extracellular medium-chain-length poly(3-hydroxyalkanoate) (MCL-PRA) depolymerase

(PhaZ(PalM4-7)) from *P. alcaligenes* M4-7 was 28.0 kDa, as determined by SDS-PAGE. The PhaZ(PalM4-7) was most active in 50 mM glycine-NaOH buffer (pH 9.0) at 35 degrees C. It was insensitive to dithiothreitol, sodium azide, and iodoacetamide, but susceptible to p-hydroxymercuribenzoic acid, N-bromosuccinimide, acetic anhydride, EDTA, diisopropyl fluorophosphate, phenylmethylsulfonyl fluoride, Tween 80, and Triton X-100. In this study, the genes encoding MCL-PHA depolymerase were cloned, sequenced, and characterized from a soil bacterium, *P. alcaligenes* LB19 (Kim et al., 2002, *Biomacromolecules* 3, 291-296) as well as *P. alcaligenes* M4-7. The structural gene (PhaZ(PalLB19)) of MCL-PHA depolymerase of *P. alcaligenes* LB19 consisted of an 837 bp open reading frame (ORF) encoding a protein of 278 amino acids with a deduced M-r of 30,188 Da. However, the MCL-PHA depolymerase gene (phaZ(PalM4-7)) of *P. alcaligenes* M4-7 was composed of an 834 bp ORF encoding a protein of 277 amino acids with a deduced M-r of 30,323 Da. Amino acid sequence analyses showed that, in the two different polypeptides, a substrate-binding domain and a catalytic domain are located in the N-terminus and in the C-terminus, respectively. The PhaZ(PalLB19) and the PhaZ(PalM4-7) commonly share the lipase box, GISSG in their catalytic domains, and utilize (111)Asn and (110)Ser residues, respectively, as oxyanions that play an important role in transition-state stabilization of hydrolytic reactions.

#### ORGN Classifier

Pseudomonadaceae 06508

#### Super Taxa

Gram-Negative Aerobic Rods and Cocci; Eubacteria; Bacteria;

Microorganisms

#### Organism Name

*Pseudomonas alcaligenes* (species): strain-LB19,  
strain-M4-7

#### Taxa Notes

Bacteria, Eubacteria, Microorganisms

#### RN 60-00-4 (EDTA)

108-24-7 (acetic anhydride)

3483-12-3 (dithiothreitol)

9002-93-1 (Triton X-100)

26628-22-8 (sodium azide)

128-08-5 (N-bromosuccinimide)

9005-65-6 (Tween 80)

55-91-4 (diisopropyl fluorophosphate)

144-48-9 (iodoacetamide)

329-98-6 (phenylmethylsulfonyl fluoride)

134736-36-0 (poly(3-hydroxy-5-phenylvalerate))

1126-48-3 (p-hydroxymercuribenzoic acid)

#### GEN *Pseudomonas alcaligenes* MCL-PHA gene (Pseudomonadaceae)

#### CC Genetics - General 03502

Biochemistry studies - General 10060

Physiology and biochemistry of bacteria 31000

Genetics of bacteria and viruses 31500

#### IT Major Concepts

Molecular Genetics (Biochemistry and Molecular Biophysics)

#### IT Chemicals & Biochemicals

EDTA; acetic anhydride; dithiothreitol; Triton X-100; sodium  
azide; N-bromosuccinimide; Tween 80; diisopropyl  
fluorophosphate; iodoacetamide; phenylmethylsulfonyl fluoride;  
poly(3-hydroxybutyrate-co-3-hydroxyvalerate);  
poly(3-hydroxyoctanoate); poly(alpha-caprolactone);  
poly(3-hydroxy-5-phenylvalerate); poly(3-hydroxyalkanoates);  
p-hydroxymercuribenzoic acid

#### IT Methods & Equipment

SDS-polyacrylamide gel electrophoresis [SDS-PAGE];  
electrophoretic techniques, laboratory techniques

#### IT Miscellaneous Descriptors

molecular characterization

#### ORGN Classifier

Pseudomonadaceae 06508

#### Super Taxa

Gram-Negative Aerobic Rods and Cocci; Eubacteria; Bacteria;

Microorganisms

#### Organism Name

*Pseudomonas alcaligenes* (species): strain-LB19,  
strain-M4-7

#### Taxa Notes

Bacteria, Eubacteria, Microorganisms

#### RN 60-00-4 (EDTA)

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329-98-6 (phenylmethylsulfonyl fluoride)

134736-36-0 (poly(3-hydroxy-5-phenylvalerate))

1126-48-3 (p-hydroxymercuribenzoic acid)  
 GEN *Pseudomonas alcaligenes* MCL-PHA gene (Pseudomonadaceae)

L64 ANSWER 14 OF 15 BIOSIS COPYRIGHT (c) 2007 The Thomson  
 Corporation on STN

ACCESSION NUMBER: 1999:526726 BIOSIS [Full-text](#)

DOCUMENT NUMBER: PREV199900526726

TITLE: Intracellular depolymerase activity in isolated  
 inclusion bodies containing  
 polyhydroxyalkanoates with long alkyl and  
 functional substituents in the side chain.

AUTHOR(S): Foster, L. J. R.; Lenz, R. W.; Fuller, R. C.  
 [Reprint author]

CORPORATE SOURCE: Department of Biochemistry and Molecular Biology,  
 University of Massachusetts, Amherst, MA, 01003,  
 USA

SOURCE: International Journal of Biological Macromolecules,  
 (Nov., 1999) Vol. 26, No. 2-3, pp. 187-192, print.  
 CODEN: IJBMDR. ISSN: 0141-8130.

DOCUMENT TYPE: Article

LANGUAGE: English

ENTRY DATE: Entered STN: 10 Dec 1999

Last Updated on STN: 5 Jun 2000

ED Entered STN: 10 Dec 1999

Last Updated on STN: 5 Jun 2000

AB The in vitro degradation of isolated *Pseudomonas oleovorans* inclusion bodies containing either poly-3- hydroxynonanoate (PHN), or poly(-3- hydroxy-5-phenylvalerate) (PHPV), or a mixture of these two polymers was investigated. When incubated at 30degreeC and pH 9, inclusion bodies containing either polyhydroxyoctanoate (PHO), PHN or PHPV exhibited similar degradation rates of approximately 0.94 (+-3%) mg/h. The PHN and PHPV components for inclusion bodies containing a mixture of PHN and PHPV showed similar degradation rates; that is the ratios showed little change and remained at approximately 50 weight% (+-3%) for each component. These results contrast markedly with in vivo studies for similar inclusion bodies in whole cells. The results suggest that the synthesis and degradation of these novel polyhydroxyalkanoates by *P. oleovorans* proceeds by the same enzymatic pathway. In addition, comparisons between the in vivo and in vitro polymer degradation suggest that the activity of the intracellular depolymerase does not control the rate limiting step of PHPV degradation in vivo. Instead, the presence of an aromatic group in the repeating units of this polymer may inhibit the utilization of the monomeric units of PHPV as a reserve carbon source by the cells.

TI Intracellular depolymerase activity in isolated inclusion bodies  
 containing polyhydroxyalkanoates with long alkyl and  
 functional substituents in the side chain.

AB The in vitro degradation of isolated *Pseudomonas oleovorans* inclusion bodies containing either poly-3- hydroxynonanoate (PHN), or poly(-3- hydroxy-5-phenylvalerate) (PHPV), or a mixture of these two polymers was investigated. When incubated at 30degreeC and pH 9, inclusion bodies containing either polyhydroxyoctanoate (PHO), PHN or PHPV exhibited similar degradation rates of approximately 0.94 (+-3%) mg/h. The PHN and PHPV components for inclusion bodies containing a mixture of PHN and PHPV showed similar degradation rates; that is the ratios showed little change and remained at approximately 50 weight% (+-3%) for each component. These results contrast markedly with in vivo studies for similar inclusion bodies in whole cells. The results suggest that the synthesis and degradation of these novel polyhydroxyalkanoates by *P. oleovorans* proceeds by the same enzymatic pathway. In addition, comparisons between the in vivo and in vitro polymer degradation suggest that the activity of the intracellular depolymerase does not control the rate limiting step of PHPV degradation in vivo. Instead, the presence of an aromatic group in the repeating units of this polymer may inhibit the utilization of the monomeric units of PHPV as a reserve carbon source by the cells.

IT Major Concepts

Enzymology (Biochemistry and Molecular Biophysics)

IT Parts, Structures, & Systems of Organisms  
 inclusion bodies

IT Chemicals & Biochemicals

depolymerase: intracellular; poly(-3-hydroxy-5-phenylvalerate)  
 [PHPV]; poly-3-hydroxynonanoate [PHN];  
 polyhydroxyalkanoates

ORGN Classifier

Pseudomonadaceae 06508

Super Taxa

Gram-Negative Aerobic Rods and Cocci; Eubacteria; Bacteria;

Microorganisms

Organism Name

*Pseudomonas oleovorans*

Taxa Notes

Bacteria, Eubacteria, Microorganisms

RN 9030-73-3 (depolymerase)

134736-36-0 (poly(-3-hydroxy-5-phenylvalerate))

134736-36-0 (PHPV)

CC Enzymes - General and comparative studies: coenzymes 10802

Biochemistry studies - General 10060

Physiology and biochemistry of bacteria 31000

Food microbiology - General and miscellaneous 39008

IT Major Concepts

Enzymology (Biochemistry and Molecular Biophysics)

IT Parts, Structures, & Systems of Organisms  
inclusion bodies

IT Chemicals & Biochemicals  
depolymerase: intracellular; poly(-3-hydroxy-5-phenylvalerate)  
[PHPV]; poly-3-hydroxyonanoate [PHN];  
polyhydroxyalkanoates

IT Miscellaneous Descriptors  
industrial microbiology

ORGN Classifier  
Pseudomonadaceae 06508  
Super Taxa  
Gram-Negative Aerobic Rods and Cocci; Eubacteria; Bacteria;  
Microorganisms  
Organism Name  
Pseudomonas oleovorans  
Taxa Notes  
Bacteria, Eubacteria, Microorganisms

RN 9030-73-3 (depolymerase)  
134736-36-0 (poly(-3-hydroxy-5-phenylvalerate))  
134736-36-0 (PHPV)

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Corporation on STN  
ACCESSION NUMBER: 1999:39335 BIOSIS [Full-text](#)  
DOCUMENT NUMBER: PREV199900039335  
TITLE: Isolation of an aromatic  
polyhydroxyalkanoates-degrading bacterium.  
AUTHOR(S): Ju, He-Sug; Kim, Jungho; Kim, Hoon [Reprint author]  
CORPORATE SOURCE: Dep. Agric. Chem., Sunchon Natl. Univ., Sunchon  
540-742, South Korea  
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1998) Vol. 8, No. 5, pp. 540-542. print.  
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Last Updated on STN: 3 Feb 1999

AB Five microorganisms capable of degrading an aromatic medium-chain-length polyhydroxyalkanoate (PHAMCL), poly(3-hydroxy-5-phenylvalerate) (PHPV), were isolated from wastewater-treatment sludge. Among the isolates, JS02 showed degrading activity consistently during several transfers. The isolate JS02 could hydrolyze another aromatic MCL copolyester, poly(3-hydroxy-5-phenoxylvalerate-co-3-hydroxy-7-phenoxylheptanoate), (P (SPOHV-co-7POHH)), and other short-chain-length PHAs (PHASCL) such as poly(3-hydroxybutyrate) (P3(HB)), poly(3-hydroxybutyrate-co-4-hydroxybutyrate) (P(3HB-co-4HB)), and poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (P(3HB-co-3HV)) with relatively low activity. The culture supernatant of JS02 showed hydrolyzing activity for the p-nitrophenyl esters of fatty acids.

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IT Major Concepts  
Bacteriology; Metabolism; Methods and Techniques

IT Chemicals & Biochemicals  
aromatic polyhydroxyalkanoate: degradation,  
isolation; poly(3-hydroxy-5-phenylvalerate)

RN 134736-36-0 (poly(3-hydroxy-5-phenylvalerate))

CC Microbiological apparatus, methods and media 32000  
Biochemistry methods - General 10050  
Biophysics - Methods and techniques 10504  
Metabolism - General metabolism and metabolic pathways 13002  
Physiology and biochemistry of bacteria 31000

IT Major Concepts  
Bacteriology; Metabolism; Methods and Techniques

IT Chemicals & Biochemicals  
aromatic polyhydroxyalkanoate: degradation,  
isolation; poly(3-hydroxy-5-phenylvalerate)

IT Methods & Equipment  
bacteria isolation: Isolation/Purification Techniques: CT,  
isolation method; bacterial culture: cell culture techniques,  
culture method; gas chromatography: chromatographic techniques,  
isolation method

10/531,689

ORGN Classifier

Bacteria 05000

Super Taxa

Microorganisms

Organism Name

bacteria

Taxa Notes

Bacteria, Eubacteria, Microorganisms

RN 134736-36-0 (poly(3-hydroxy-5-phenylvalerate))

FULL SEARCH HISTORY

=&gt; d his nofile

(FILE 'HOME' ENTERED AT 10:21:20 ON 30 AUG 2007)

FILE 'HCAPLUS' ENTERED AT 10:21:28 ON 30 AUG 2007

E US20060211100/PN

L1 1 SEA ABB=ON PLU=ON US20060211100/PN  
 D ALL  
 SEL RN

FILE 'REGISTRY' ENTERED AT 10:22:32 ON 30 AUG 2007

L2 56 SEA ABB=ON PLU=ON (686753-12-8/BI OR 10028-15-6/BI  
 OR 112-05-0/BI OR 112-38-9/BI OR 113-24-6/BI OR  
 119003-51-9/BI OR 121739-61-5/BI OR 13907-47-6/BI OR  
 14333-13-2/BI OR 147867-05-8/BI OR 15056-35-6/BI OR  
 153744-07-1/BI OR 16177-21-2/BI OR 173395-00-1/BI OR  
 198274-26-9/BI OR 20492-10-8/BI OR 21010-06-0/BI OR  
 2270-20-4/BI OR 27588-56-3/BI OR 325698-86-0/BI OR  
 358657-18-8/BI OR 358718-36-2/BI OR 3903-40-0/BI OR  
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 446881-43-2/BI OR 452081-78-6/BI OR 452081-80-0/BI OR  
 454458-22-1/BI OR 457655-22-0/BI OR 463301-93-1/BI OR  
 477345-08-7/BI OR 483343-33-5/BI OR 484040-48-4/BI OR  
 50-99-7/BI OR 56721-43-8/BI OR 591251-75-1/BI OR  
 5962-88-9/BI OR 6303-58-8/BI OR 64740-39-2/BI OR  
 647831-62-7/BI OR 647831-63-8/BI OR 647831-64-9/BI OR  
 647831-65-0/BI OR 686753-13-9/BI OR 686753-17-3/BI OR  
 686753-18-4/BI OR 686753-19-5/BI OR 689291-81-4/BI OR  
 694533-29-4/BI OR 694533-30-7/BI OR 694533-31-8/BI OR  
 7170-40-3/BI OR 7722-64-7/BI OR 818-88-2/BI)  
 D SCAN

FILE 'STNGUIDE' ENTERED AT 10:23:23 ON 30 AUG 2007

FILE 'REGISTRY' ENTERED AT 10:29:02 ON 30 AUG 2007

L3 28 SEA ABB=ON PLU=ON L2 AND C6/ES  
 D SCAN

FILE 'STNGUIDE' ENTERED AT 10:31:12 ON 30 AUG 2007

FILE 'LREGISTRY' ENTERED AT 10:34:01 ON 30 AUG 2007

L4 STR

FILE 'REGISTRY' ENTERED AT 10:38:33 ON 30 AUG 2007

E A/PCT

L5 1 SEA SSS SAM L4  
 D SCAN  
 L6 1299 SEA SSS FUL L4  
 SAV TEMP L6 LIL689REG/A  
 L7 10 SEA ABB=ON PLU=ON L2 AND L6  
 D SCAN  
 L8 134 SEA ABB=ON PLU=ON L6 AND PMS/CI  
 L9 1165 SEA ABB=ON PLU=ON L6 NOT L8  
 L10 20 SEA ABB=ON PLU=ON L6 AND (MEDLINE/LC OR BIOSIS/LC OR  
 DRUGU/LC OR EMBASE/LC)  
 D SCAN

FILE 'HCAPLUS' ENTERED AT 10:46:04 ON 30 AUG 2007

L11 25 SEA ABB=ON PLU=ON L7  
 L12 949 SEA ABB=ON PLU=ON L6  
 L13 1 SEA ABB=ON PLU=ON L1 AND L12  
 D SCAN  
 E PSEUDOMONAS/CT  
 E E3+ALL  
 L14 57652 SEA ABB=ON PLU=ON PSEUDOMONAS+PFT,OLD,NT/CT  
 L15 91 SEA ABB=ON PLU=ON L12 AND L14  
 L16 QUE ABB=ON PLU=ON PSEUDOMONAS?  
 L17 QUE ABB=ON PLU=ON POLYHYDROXYALKANOATE OR POLY(W)HYDR  
 OXYALKANOATE OR POLY(W)HYDROXY(W)ALKANOATE  
 L18 QUE ABB=ON PLU=ON COPOLYM? OR CO(W)POLYM?  
 L19 QUE ABB=ON PLU=ON L17(3A)L18

L20 99 SEA ABB=ON PLU=ON L12 AND L16  
 L21 99 SEA ABB=ON PLU=ON L15 OR L20  
 L22 2313 SEA ABB=ON PLU=ON POLYHYDROXYALKANOATE OR POLY(W)HYDR  
 OXYALKANOATE OR POLY(W)HYDROXY(W)ALKANOATE  
 L23 78 SEA ABB=ON PLU=ON L21 AND L22  
 L24 8 SEA ABB=ON PLU=ON L21 AND L19  
 D SCAN  
 L25 1 SEA ABB=ON PLU=ON L1 AND L24  
 D L24 1-8 AU  
 DEL SEL  
 SEL L1 AU  
 L26 763 SEA ABB=ON PLU=ON ("FUKUI, TATSUKI"/AU OR "HONMA,  
 TSUTOMU"/AU OR "IMAMURA, TAKESHI"/AU OR "KENMOKU,  
 TAKASHI"/AU OR "KOZAKI, SHINYA"/AU OR "MIHARA,  
 CHIEKO"/AU OR "YANO, TETSUYA"/AU)  
 E SUGAWA E/AU  
 L27 QUE ABB=ON PLU=ON SUGAWA E?/AU  
 L28 786 SEA ABB=ON PLU=ON L27 OR L26

FILE 'ZCAPLUS' ENTERED AT 10:59:47 ON 30 AUG 2007

L29 QUE ABB=ON PLU=ON FUKUI T?/AU  
 L30 QUE ABB=ON PLU=ON HOMA T?/AU  
 L31 QUE ABB=ON PLU=ON IMAMURA T?/AU  
 L32 QUE ABB=ON PLU=ON KENMOKU T?/AU  
 L33 QUE ABB=ON PLU=ON KOZAKI S?/AU  
 L34 QUE ABB=ON PLU=ON MIHARA C?/AU  
 L35 QUE ABB=ON PLU=ON YANO T?/AU  
 L36 QUE ABB=ON PLU=ON L27 OR (L29 OR L30 OR L31 OR L32  
 OR L33 OR L34 OR L35)  
 L37 QUE ABB=ON PLU=ON L27 AND L29 AND L30 AND L31 AND  
 L32 AND L33 AND L34 AND L35

FILE 'HCAPLUS' ENTERED AT 11:03:31 ON 30 AUG 2007

D L1 PA

FILE 'ZCAPLUS' ENTERED AT 11:03:31 ON 30 AUG 2007

E CANON/PA

E CANON KABUSHIKI/PA

L38 QUE ABB=ON PLU=ON (CANON(W)KABUSHIKI?)/PA,CS,SO,CO

FILE 'HCAPLUS' ENTERED AT 11:04:52 ON 30 AUG 2007

L39 0 SEA ABB=ON PLU=ON L27 AND L29 AND L30 AND L31 AND  
 L32 AND L33 AND L34 AND L35  
 L40 0 SEA ABB=ON PLU=ON L27 AND L29 AND L31 AND L32 AND  
 L33 AND L34 AND L35  
 L41 9410 SEA ABB=ON PLU=ON L27 OR (L29 OR L30 OR L31 OR L32  
 OR L33 OR L34 OR L35)  
 L42 122 SEA ABB=ON PLU=ON L41 AND L38  
 L43 119 SEA ABB=ON PLU=ON (L42 OR L28) AND L16  
 L44 80 SEA ABB=ON PLU=ON L43 AND L17  
 L45 21 SEA ABB=ON PLU=ON L43 AND L18  
 D 1-3 KWIC  
 L46 QUE ABB=ON PLU=ON PY<2003 OR PRY<2003 OR AY<2003 OR  
 MY<2003 OR REVIEW/DT  
 L47 20 SEA ABB=ON PLU=ON L45 AND L46  
 SAV L47 LIL689HCPIN/A  
 L48 24 SEA ABB=ON PLU=ON L23 AND L18  
 L49 24 SEA ABB=ON PLU=ON L48 OR L24  
 L50 21 SEA ABB=ON PLU=ON L49 AND L46  
 L51 8 SEA ABB=ON PLU=ON L50 AND L24  
 L52 11 SEA ABB=ON PLU=ON L50 NOT L47  
 SAV L52 LIL689HCP/A  
 D QUE L52

FILE 'MEDLINE, BIOSIS, DRUGU, EMBASE' ENTERED AT 11:14:08 ON 30  
 AUG 2007

L53 67 SEA ABB=ON PLU=ON L10  
 L54 3 SEA ABB=ON PLU=ON L53 AND L16  
 L55 2 SEA ABB=ON PLU=ON L53 AND L17  
 L56 4 SEA ABB=ON PLU=ON L54 OR L55  
 L57 255 SEA ABB=ON PLU=ON L28  
 L58 10077 SEA ABB=ON PLU=ON L36 OR L57  
 L59 60 SEA ABB=ON PLU=ON L58 AND L38  
 L60 34 SEA ABB=ON PLU=ON L59 AND (L16 OR L17)

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STC

56-56

L61 7 SEA ABB=ON PLU=ON L60 AND L46  
D SCAN  
SAV L61 LIL689MULTIN/A  
L62 4 SEA ABB=ON PLU=ON L56 NOT L61  
SAV L62 LIL689MULT/A

FILE 'STNGUIDE' ENTERED AT 11:19:54 ON 30 AUG 2007  
D QUE L47  
D QUE L61

FILE 'HCAPLUS, BIOSIS' ENTERED AT 11:22:00 ON 30 AUG 2007  
L63 27 DUP REM L47 L61 (0 DUPLICATES REMOVED)  
ANSWERS '1-20' FROM FILE HCAPLUS  
ANSWERS '21-27' FROM FILE BIOSIS  
D L63 1-27 IBIB ED AB  
D QUE STAT L52  
D QUE STAT L62

FILE 'HCAPLUS, MEDLINE, BIOSIS' ENTERED AT 11:23:35 ON 30 AUG 2007  
L64 15 DUP REM L52 L62 (0 DUPLICATES REMOVED)  
ANSWERS '1-11' FROM FILE HCAPLUS  
ANSWER '12' FROM FILE MEDLINE  
ANSWERS '13-15' FROM FILE BIOSIS  
D L64 1-11 IBIB ED ABS HITSTR HITIND  
D L64 12-15 IBIB ED AB HIT IND